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(OF THE)

CANTERBURY MUSEUM

Christchurch, N.Z.

Vol. II. No. 1.

Published by Order of the Board of Governors

EDGAR R. WAITE, F.L.S., Curator

CHRISTCHURCH, NEW ZEALAND

23rd December, 1913

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Prof. R. SPEIGHT, M.A., M.Sc., F.G.S., F.Am.G.S.
Curator

CHRISTCHURCH, NEW ZEALAND

1913-1925

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FISHES of the GENUS *TRIPTERYGION* and RELATED GENERA in NEW ZEALAND

By Edgar R. Waite, F.L.S., Curator.

Plates I.—V.

With a view to arriving at a better knowledge of the New Zealand species of the Blennioid genus *Tripterygion*, I have collected specimens of this and other genera from various localities, chiefly from rock pools, worked at low tide. Toll was taken from the following districts, namely:—Kaikoura, Lyttelton (Sumner and Taylor's Mistake), Akaroa, Chatham Islands, Auckland Islands, and the Snares. Mr. Henry Suter sent me specimens from Great Barrier Island, Hauraki Gulf, and I have examined the few examples which the Museum furnished.

I have not yet seen specimens from Westland, whence Clarke obtained the material upon which he founded his three nominal species. With the possible exception of *T. dorsale*, which I have associated with *T. medium*, there can be no doubt that they are correctly ascribed to the species under which name they respectively stand in the following pages.

Ten nominal species have appeared in our literature, but in 1904 Hutton[1] accepted only seven of these as valid, namely:—"*T. tripinne* Forster, *T. decemdigitatum* Clarke, *T. medium* Günther, *T. dorsale* Clarke, *T. varium* Forster, *T. nigripenne* Cuvier and Valenciennes, and *T. robustum* Clarke." I find that all specimens seen by me may be referred to one of three species, namely, *T. tripenne*, *T. medium*, and *T. varium*, all of which are well characterised by structural details. The colouration of the last-named is, however, so diversified that it is only by examination of a large series that a just idea can be formed; for example, specimens from the Chatham Islands have quite a

(1) Hutton, Index Faunæ Novæ Zealandiæ, 1904, p. 46.

different colour scheme from those of our South Island shores, yet, apart from this colour character, no difference can be observed.

I had hoped to study the whole of our fishes of the family *Blennida*, but have hitherto been unable to obtain specimens of some forms, and an appeal to Mr. Hamilton,[2] Director of the Dominion Museum, Wellington, where the types of *Stichæus rubrum* and *Auchenopterus aysoni*, were believed to be, reveals the fact that they are now non-existent. While, therefore, dealing with the members of the genera *Tripterygion*, *Notoclinus*, and *Ericentrus* at some length I have had to be content, for the present, with a mere notice of *Auchenopterus* and *Cologrammus* as culled from the original descriptions and figures, which are, however, not wholly satisfactory.

Key to the Genera.

a. Three dorsal fins.

b. Spines of the first dorsal increase in height backwards, Second dorsal longer than the third

Tripterygion

bb. Spines of the first dorsal decrease in height backwards, Second dorsal shorter than the third

Notoclinus

aa. Two dorsal fins.

c. First dorsal higher than anterior spines of second dorsal, caudal pedunculate.

d. Dorsal with 3 to 8 rays posteriorly

Cristiceps

(2) Mr. Hamilton died at Russell, Bay of Islands, 12th Oct., 1913. Widely known as a prolific writer on the Maori and his art, Mr. Hamilton also wrote on biological subjects, including fishes, his best known contribution to the subject being: "List of papers on New Zealand Fishes and Fishing" (T.N.Z.I., xxxiv. 1902, pp. 539-548).

dd. Dorsals composed of spines only or with but a single soft ray

Auchenopterus

cc. Dorsals of uniform height with only a single soft ray, caudal not pedunculate

Ericentrus

aaa. One dorsal fin.

e. Dorsal with six soft rays

Cologrammus

TRIPTERYGION Risso, 1826.

Body robust, covered with ciliate scales of moderate size; lateral line incomplete or interrupted. Head naked. Dorsal fin of three distinct portions, which may be connected at their bases, the first ascendant of 3 to 6 spines, the spines of the second fin more numerous than the rays of the third. Anal fin longer than the second dorsal. Pectoral fin long, the lower rays simple and thickened. Ventrals jugular. Caudal rounded.

a. Head pointed, lateral line extends to below the third dorsal

tripenne

aa. Head rounded, lateral line terminates under the second dorsal.

b. First dorsal of four spines, the lateral line falls to the mid line of the body

medium

bb. First dorsal of five or six spines, the lateral line follows the dorsal contour

varium

Tripterygion tripenne Forster.

Blennius tripennis Forster, in Bloch & Schneider, Syst. Ichth. 1801, p. 174, and Descr. Anim. 1844, p. 125.

Tripterygion forsteri Cuvier and Valenciennes, Hist. Nat. Poiss. xi., 1836, p. 415.

Tripterygium forsteri Günther. Cat. Fish. Brit. Mus. iii., 1861. p. 278.

Trypterygium forsteri Hutton. Cat. Fish. N.Z. 1872. p. 31.

Trypterygium tripennis Hutton. T.N.Z.I. ix. 1877. p. 354.

Trypterigium decemdigitatus Clarke. T.N.Z.I. xi., 1879. p. 292. pl. xv.

Plate I.

B. vi.; D. iii. xix. 14; A. 27; V. 2; P. 17; C. 13; Sc. 44; L. lat. 34; L. tr. 8 + 16.

Length of head 3·95; height of body 4·46 and length of caudal 4·65 in the length; diameter of eye 4·0; length of snout 3·45, and interorbital space 6·6 in the length of the head.

The head is sub-acute, nearly flat above, the profile of the snout very low, interorbital space flat, eyes close together directed obliquely upwards and cutting the upper profile, a comb-like tentacle with ten teeth above the hinder angle of the orbit; jaws equal; the maxilla extends to beneath the first third of the eye. The posterior nostril is close to the upper angle of the eye and the anterior one is midway between it and the upper lip, it has a tentacle with four branches.

Teeth.—A very broad band of teeth in the jaws, teeth also on the vomer and palatines; a broad frenum behind the upper teeth.

Fins.—The first spine arises over the edge of the preopercle, the others are progressively higher, the third being equal to the length of the snout and eye together; the second fin begins behind the root of the pectoral, and the third midway between the head and the end of the caudal; the highest rays of these fins are sub-equal, and are as high as the body at the insertion of the third fin. The anal commences beneath the eighth spine of the second dorsal and terminates evenly with the last ray. The pectoral is evenly pointed, the tips of its lower rays being free. The ventrals arise close together and the inner ray is the longer equal to the post-nasal length of the head. The caudal is well rounded and its peduncle is deep, equal to one-half the height of the body.

Scales.—Head, and space in front of the ventrals naked, the whole body, including a narrow space in front of the dorsal fin and the base of the pectoral, clothed with large finely ciliated scales, those on the back, chest, and belly very small. The lateral

line commences at the opercular angle, rises very slightly over the pectoral, and follows the dorsal profile to below the fifth last dorsal ray, the thirty-four scales thus embraced are tubular, two series of scales below, the line is continued along about six non-tubular scales to the caudal.

Colours.—Head and body deep blue black, scarcely lighter beneath, but brown on the chest, ventrals pale grey; all the other fins black; the anal edged with grey.

Length.—96 mm.

Hab.—Hauraki Gulf, Auckland, Otago, Dusky Sound, West Coast, S.I.

Distinguishing features of *T. tripenne* are the low pointed head, the high fins, of which the first dorsal is formed of three spines only, the multifid tentacle over the eye, the long lateral line, following the dorsal contour, and the dark and, generally, uniform colouration.

The description is drawn up from one of two specimens sent to me by Mr. H. Suter, from Hauraki Gulf. They do not exhibit trace of the spot at the base of the pectoral, described by Forster, but a series of specimens would no doubt show many variations in colour and markings.

Tripterygion medium Günther.

Tripterygium medium Günther, Cat. Fish. Brit. Mus. iii., 1861, p. 278.

Tripterygium medium Hutton, Cat. Fish N.Z. 1872, p. 32.

Trypterigium dorsalis Clarke, T.N.Z.I. xi. 1879, p. 291, pl. xv.

Plate II.

B. vi.; D. iv. xvii. 12; A. 22; P. 15; V. 2; C. 12 + 2; Sc. 61; L. lat. 21, L. tr. 10 + 7.

Length of head 3·45; height of body 4·15, and length of caudal 4·0 in the length; diameter of eye 5·1; length of snout 4·0, and interorbital space 6·8 in the length of the head.

The head is nearly flat above, the profile of the snout very steep, eyes close together directed obliquely upwards, interorbital space slightly concave; upper jaw slightly the longer; the maxillary reaches to nearly below the middle of the eye; posterior nostril immediately in front of the middle of the eye.

anterior nostril midway between it and the upper edge of the lip, it is furnished with a bifid tentacle; no tentacle over the eye.

Teeth.—A single series of sharp teeth in the jaws followed by a band of minute teeth, a broad frenum behind the upper teeth.

Fins.—The first spine, whose length is equal to the diameter of the eye, arises over the edge of the preopercle, the others rise regularly to the fourth, which is twice the height of the first. The second fin begins behind the root of the pectoral and the third midway between the head and the end of the caudal; though higher than the first, the second and third fin rays are comparatively low, the highest rays being less than the body at the origin of the third dorsal. The anal commences beneath the ninth spine of the second dorsal and terminates posteriorly to the last dorsal ray. The pectoral is rounded, the tips of its lower rays being free. The inner ray of the ventral is the longer, its length being equal to the distance between the anterior nostril and the opercular margin. The caudal is rounded and the peduncle narrow, its height being less than one-third that of the body.

Scales.—Head, throat, chest and a space on each side of the spinous dorsals and of the anal fin naked; the scales are small and finely ciliated. The lateral line arises well above the origin of the pectoral, and passes downwards with the concavity above, to the mid-line of the body, terminating below the base of the fifth last spine of the second dorsal fin; about two scales exceeding the reach of the pectoral. The lateral line is very pronounced, and in some specimens may be continued to the caudal.

Colours.—Reddish brown above and grey beneath, head brown with irregular darker blotches; body with six black blotches across the back, one at the commencement of each of the three fins, one below the middle of the second and third fins respectively, and one on the caudal peduncle: a zigzag runs along the mid line of the body, a blue spot in each lower wave: upper half of first dorsal black, about five rows of dark spots on the second and third fins, pectoral with seven and caudal with ten bars, anal grey barred and tipped with white, ventrals white.

Length.—85·2 mm.

Hab.—Great Barrier Is., Wellington, Kaikoura, Lyttelton, Hokitika.

This species may be readily detected by the contour of the lateral line, which is concave above, by the absence of an orbital tentacle, and by the body markings. The spines of the first

dorsal fin appear to be constantly four in number,[3] but other variations are indicated below:—

D. iv. xv.-xvii. 11-13. A. 20-25.

T. dorsale Clarke, from Hokitika, on the west coast of the South Island, differs from typical examples only by the circumstance that the lateral line extends to the base of the caudal rays, and I have a specimen from Canterbury which exhibits this feature. The author describes the nostril as being single, very minute, and close below the eye. The eastern specimen has the usual double nostril, as shown in the drawing, and the ventral rays are neither short nor extremely fleshy as described and figured by Clarke. The difference in comparative dimensions may be explained by the fact that the author included the caudal in computing the relative lengths of the fish.

The illustrations which accompany the late Mr. F. E. Clarke's papers are not very satisfactory, and would lead one to think that the originals were crude. I have recently had the opportunity of examining some of these, and in justice to Mr. Clarke's memory I should like to say that they were very carefully prepared, and quite satisfactory as originals, but were evidently executed without a knowledge of the limitations of the reproductive process, at any rate as exemplified by the workers responsible for those particular reproductions.

Tripterygion varium Forster.

Blennius varius Forster, in Bloch and Schneider, Syst. Ichth. 1801, p. 178, and Descr. Anim. 1844, p. 127.

Tripterygion varium Cuvier and Valenciennes, Hist. Nat. Poiss. xi. 1836, p. 414. Waite, Pisces, Sub-ant. Is. N.Z., ii. 1909, p. 597.

Tripterygion nigripenne Cuvier and Valenciennes, *loc. cit.* p. 413, pl. cccxxxix.

Tripterygion capito Jenyns, Fishes Voy. "Beagle," 1841, p. 94; pl. xix. fig. 1.

Tripterygium varium Günther, Cat. Fish. Brit. Mus. iii. 1861, p. 277. Hutton, Cat. Fish. N.Z. 1872, p. 33.

(3) Günther writes:—"D. 4(5)" I have examined a large number of specimens but in none found five spines.

Tripterygium nigripinne Günther, *loc. cit.*, p. 277. Hutton, *loc. cit.* p. 31, and T.N.Z.I. v. 1873, p. 263, and ix. 1877, p. 354.

Trypterygium forsteri Hutton, T.N.Z.I. v. 1873, p. 263.

Tryterygium fenestratum Hutton, T.N.Z.I. v. 1873, p. 263.

Trypterigium robustum Clarke, T.N.Z.I. xi. 1879, p. 292, pl. xv.

Tripterygium jenningsi Hutton, T.N.Z.I. xi. 1879, p. 339.

Plate III.

B. vi.; D. v.-vi., xx. 12; A. 25; P. 17; V. 2; C. 11. L. lat. 24; L. tr. 8 + 16.

Length of head 3·9, height of body 4·0, and length of caudal 4·6 in the length; diameter of eye 3·8, and interorbital space 8·0 in the head.

The head is flat above with the profile of the snout very steep, interorbital space flat, eyes not close together, directed outwards, the orbits free from the upper profile; jaws equal, the maxilla extends to nearly below the middle of the eye. Posterior nostril in front of the upper angle of the eye, the anterior one midway between it and the upper lip, with a simple tentacle; a bifid tentacle over each eye.

Teeth.—The teeth are pointed, in a single series in each jaw, followed by a broad band; similar teeth on the palatines and vomer; a frenum behind the upper teeth.

Fins.—The first dorsal fin commences over the edge of the preopercle, the second behind the root of the pectoral, and the third at a point much nearer the end of the caudal than the opercular border; the first spine is a little longer than the diameter of the eye, the following rise regularly to the fifth (or sixth) which is one half longer than the first; the highest spines of the second fin are one-half higher than the fifth (or sixth) spine and the anterior rays of the third fin are still higher. The anal arises below the seventh spine of the second dorsal and its rays terminate evenly with those of the third dorsal. The pectoral is evenly pointed and extends to a point equal to its distance from the head. The ventrals are rather short, the inner or longest ray being equal to the length of the head, less the snout. The caudal is rounded and its peduncle rather low, its height rather more than half that of the body at the insertion of the third dorsal fin.

Scales.—Head, to the commencement of the dorsal fin, throat and chest naked, the rest of the body clothed with small finely ciliated scales. The lateral line follows the curve of the back, terminating under the fourth last ray of the second dorsal fin, about seven scales exceeding the reach of the pectoral. Two scales below, it is continued to the caudal.

Colours.—Ground colour variable, Green, olive, brown, orange, or reddish with dark markings, six more or less ring-like figures above the lateral line, fins black, grey, or red, edge of first dorsal black, second and third dorsals with markings at the base to correspond with the rings on the body, anal with a dark sub-marginal band; caudal sometimes spotted. One specimen collected at the Chatham Islands has a wholly black head and a dark line along each side of the spinous dorsal fins.

Length.—85 mm.

Hab.—Wellington, Kaikoura, Lyttelton, Akaroa, Jackson's Bay, Westland, Chatham and Auckland Islands, and the Snares.

T. varium may be distinguished by the larger number of spines, (v.-vi.) in the first dorsal fin, by the bifid tentacle over the eye, and the course of the lateral line, which follows the dorsal contour to near the termination of the second fin.

This is quite the commonest of the three species, at least, on the east coast of the South Island, and is the subject of the greatest number of synonyms.

NOTOCLINUS Gill, 1893.

Differs from *Tripterygion* in having the spines of the first dorsal fin descendant, and the second fin not longer than the third. Pectoral rays less numerous and wholly undivided.

Notoclinus fenestratus Forster.

Blennius fenestratus Forster, in Bloch and Schneider Syst. Ichth. 1801, p. 173, and Descript. Anim. 1844, p. 124.

Tripterygion fenestratum Cuvier and Valenciennes, Hist. Nat. Poiss. xi. 1836, p. 416.

Tripterygium fenestratum Günther, Cat. Fish. Brit. Mus. iii. 1861, p. 278. Hutton, T.N.Z.I. ix. 1877, p. 354.

Tripterygium compressum Hutton, Cat. Fish. N.Z. 1872, p. 32, and T.N.Z.I. v. 1873, p. 263, pl. xv. Arthur T.N.Z.I. xvii. 1885, p. 168, pl. xiv., fig. 6.

Auchenopterus compressus Hutton. T.N.Z.I. viii. 1876. p. 214.

Auchenopterus fenestratus Hutton. T.N.Z.I. xxii. 1890. p. 281.

Notoclinus fenestratus Gill, Mem. Nat. Acad. Sci., vi. 1893. pp. 119. 124.

Plate IV.

D. iv. xi. 13; A. 24; V. 2; P. 11; C. 11; Sc. 43; L. lat. 16 + 29; L. tr. 20.

Length of head 3·18; height of body 4·32; and length of caudal 3·27 in the length; diameter of eye 4·75; length of snout 3·45 and interorbital space 8·4 in the length of the head.

The head is obtuse with a low profile, eyes well separated, lateral, a spoon-like tentacle over the hinder angle of the orbit and a smaller one at the anterior nostril, interorbital space slightly convex, jaws equal, mouth large, the maxillary extending to beyond the hinder edge of the eye, gills four, a slit behind the fourth. Posterior nostril close to the front edge of the eye, the anterior nostril a short distance in advance of it. Body, robust, compressed.

Teeth.—A broad band in each jaw and at the head of the vomer, teeth present also on the palatines.

Fins.—The first dorsal fin stands wholly apart from the second, and its anterior spine is placed immediately behind the eye, it is very long being nearly equal to the depth of the head: the following spines rapidly decrease to the fourth, which is not longer than the diameter of the eye; the second fin commences behind the opercular edge and its base is equal to that of the soft dorsal, which originates midway between the operele and the base of the caudal rays. The anal arises beneath the fifth spine of the second dorsal and is coterminal with the soft fin. The pectoral rays are comparatively few in number and all are simple. The inner ventral ray is equal to half the length of the head. The caudal is large and rounded and its peduncle is equal to its length behind the anal fin.

Colour.—In preservative the general colour is orange,[4] the head is mottled with grey and brown and has two dark bars above in sequence with those on the body. The body is adorned with

(4) Prof. Benham tells me that specimens kept in aquaria at the Portobello fish hatchery are reddish-orange in colour, so that no great change takes place under preservation as in *Cristiceps* and *Ericentrus*, which in life are of greenish hues.

seven oblique bars, inclined backwards below, all the bars are more or less incomplete below, and the two posterior ones are broken up. Three bars originate each beneath the second and third dorsal fins and the seventh is on the caudal peduncle. The fins are grey, those of the dorsal having clear spaces in the membrane, there are three faint bars on the caudal rays.

Length.—121 mm.

Hab.—Otago.

CRISTICEPS Cuvier and Valenciennes, 1836.

Body moderately elongate, covered with small or rudimentary scales. Two dorsal fins, the first of three descendant spines the second long with a small number (3-8) of posterior soft rays. Lateral line complete, strongly curved anteriorly. Caudal pedunculate.

Cristiceps australis Cuvier and Valenciennes.

Cristiceps australis Cuvier and Valenciennes, Hist. Nat. Poiss. xi., 1836, p. 402, pl. cccxxxvi. Hutton, T.N.Z.I. v., 1873, p. 264.

Cristiceps macleayi Castlenau P.L.S., N.S.W. iii. 1879, p. 385.

Cristiceps howittii Castelnau P.Z.S., Vict. ii. 1873, p. 48.

Cristiceps pallidus, Macleay, P.L.S., N.S.W. vi. 1881, p. 26.

? *Cristiceps splendens* Castelnau, P.Z.S., Vict. ii. 1873, p. 66.

The Australian members of the genus have been recently studied by McCulloch[5] from whom the above synonomy and the following description of *C. australis* is accepted.

D. iii., xxvi.-xxix.; 6-8. A. ii., 24-26. V. 3. Vert. 14 + 30. First dorsal spine situated rather behind the middle of the eye. The two dorsals either entirely separate, or the first just connected to the base of the second by membrane. The dorsal rays equidistant. Caudal peduncle long and slender, the membrane from the last dorsal ray reaching from half to two-thirds along its length. A branched tentacle on the snout and a long simple one over the eye. Snout sub-conical.

Colour.—General colour green with darker bands and silvery markings.

(5) McCulloch, Rec. Aust. Mus. vii. 1908, p. 39, pl. x. fig. 3.

Hutton rendered the New Zealand localities as Bay of Islands and Cape Campbell, and there are specimens in the Auckland Museum from Hauraki Gulf.

Beyond New Zealand the species occurs in Australia and Tasmania.

AUCHENOPTERUS Günther 1861.

Differs from *Cristiceps* in having larger scales and none or but one soft ray in the dorsal fin.

Auchenopterus aysoni Hector.

Auchenopterus aysoni Hector. T.N.Z.I. xxxiv. 1902, p. 240. pl. xv.

B. iv.; D. iii. 33; A. 10; P. 8; V. 3; L. lat. 22-3-5 (interrupted).

Length of head 4·1; height of body 4·8 in the total; length of snout 3·9 and diameter of eye 8·7 in the head.

Body compressed, scales very minute; a pair of branched tentacles from above the snout, not from the nostril. Gill-openings wide, teeth minute on jaws and vomer; tail slightly unsymmetrical and caudal distinctly separate from both dorsal and caudal.

Colour.—Uniform light brown, with four oval translucent spots on the dorsal fin.

Length.—143 mm.

Hab.—Bay of Islands.

The above description is in part copied and in part deduced from the figures supplied by Hector. I have not seen a specimen of the species, and Mr. Hamilton tells me that the type, supposed to be in the Dominion Museum, no longer exists.

It may be noted that the description and the figure are far from agreeing; the dorsal is illustrated as having three more components than described, while the anal, said to have ten rays is shown as possessing twenty-one, with a gap equal to, at least four rays; the figure is probably more nearly correct. The illustration shows more pectoral rays than described, and ten rays are drawn in the caudal. The tentacle at the tip of the snout is shown, also a simple one over the eye, but the latter is not referred to.

Several points in the description taken in conjunction with the fact that the scales are very minute and the lateral line interrupted, lead to the opinion that the fish is incorrectly assigned to the genus *Auchenopterus*, but actual specimens are requisite before any pronouncement can be made.

This species differs from *A. monophthalmus* Günther, the type of the genus, in having the first dorsal fin entirely separate from and higher than the succeeding portion, a condition which Jordan and Evermann[6] have expressed in the sub-generic name *Corallicola*.

ERICENTRUS Gill, 1893.

Head and mouth small, body elongate, covered with small scales. Two dorsal fins not entirely separate, the second very long with a single posterior soft ray. Anal with two spines. Pectoral with undivided rays. Anterior portion of lateral line curved, composed of distinct scales.

Ericentrus rubrus Hutton.

Stichærium rubrum Hutton, Cat. Fish. N.Z. 1872, p. 33.

Clinus rubrus Hutton, T.N.Z.I. v. 1873, p. 264, pl. ix.

Ericentrus rubrus Gill, Mem. Nat. Acad. Sci. vi. 1893, pp. 119 and 123.

Plate V.

B. vi.; D. iv. xxxvi. 1; A. ii. 24, P. 12; V. 2; C. 12. L. lat. 25.

Length of head 5·23; height of body 4·0, and length of caudal 4·8 in the length; diameter of eye 3·2, length of snout 2·6, and interorbital space 6·5 in the length of the head.

Head small, slightly compressed, upper and lower profiles forming an acute angle, snout pointed, eyes large, occupying half the depth of the head and cutting the upper profile, a bifid tentacle above the middle of the orbit, interorbital space narrow and flat; jaws equal, the maxilla is rounded behind, not dilated, and extends to beneath the first third of the eye; gills four, a slit behind the fourth; gill-rakers small, about ten on the first arch. Posterior nostril above the front edge of the orbit, the anterior one midway between it and the end of the snout, furnished with a tentacle.

(6) Jordan and Evermann, Bull. U.S. Nat. Mus. iii. 1898, p. 2369.

Teeth.—A broad patch in each jaw and on the vomer, a frenum behind the upper teeth.

Fins.—The dorsal fin arises slightly in advance of the edge of the preopercle and its anterior spines are but little longer than the diameter of the eye, there is a notch behind the fourth (or fifth) spine and another, less marked, behind the twenty-seventh of the whole series, the spines of this third portion are slightly higher than the preceding ones, the fin is terminated by a single small ray. The anal commences beneath the twelfth spine of the second dorsal, two spines being followed by twenty-four simple rays. The pectoral is small, rounded, and composed of undivided rays. The ventrals are inserted in advance of the pectorals. The caudal is rounded of undivided rays and its peduncle is narrow, one-third greater than the diameter of the eye, the last rays of both dorsal and anal fins are attached to it by membrane.

Scales.—The entire head is naked, but the body is wholly clothed with small embedded scales; the lateral line arises above the edge of the preopercle and drops abruptly to the midline behind the pectoral, whence it passes, on less defined scales in a more or less broken series, to the caudal.

Colour.—In life the ground colour is a seaweed green with dark markings disposed as below:—A series of elongate spots close to and parallel to the dorsal profile, another series on the lateral line and usually some smaller spots below it; a dark mark behind and another below the eye; both dorsal and anal fins have oblique markings in contrary direction to the lie of the spines or rays. A few indistinct bars cross the tail.

Length.—82 mm.

Hab.—Wellington, Kaikoura, Akaroa, Chatham Is.

This species is not very common, but I have taken it in rock pools at Kaikoura and Akaroa, also at the Chatham Islands, while the type specimens were obtained in Wellington Harbour.

Hiding under weeds in the pools, the little fishes are scarcely to be found unless the water is poisoned, when they leave their retreats in common with other denizens of the pool.

So well do the colour and markings of the fish harmonise with its surroundings that even when well within view it cannot be detected until it moves, when it may be netted with a sweep of the hand-net. When transferred to preservatives, either alcohol or formaline, its colour is completely changed, the brilliant green becoming an equally brilliant red, afterwards changing to orange. This disposition to change colour is responsible for the

inappropriate name *rubrus,* which refers to the appearance of the fish after preservation.

Hutton states that the dorsal commences immediately at the back of the head, whereas its origin is in advance of the preopercle. Many of the females obtained were distended with young, showing ovoviviparity, a character as far as known, of the *Clininæ.*

COLOGRAMMUS Gill, 1893.

"The *Stichærium flavescens* or *Clinus flavescens* of Hutton is differentiated from other types (and especially *Ericentrus*) by the form, more nearly even dorsal with a short-rayed portion (about 38 spines + 6 rays), and imperfect lateral line; it may appropriately be designated as *Cologrammus.*"—(Gill.)

Cologrammus flavescens Hutton.

Stichærium flavescens Hutton, Cat. Fish. N.Z. 1872, p. 33.

Clinus flavescens Hutton, T.N.Z.I. v. 1873, p. 264, pl. xv.

Cologrammus flavescens Gill, Mem. Nat. Acad. Sci. vi. 1893, pp. 119 and 124.

B. vi. D. xxxviii. 6; A. 30; V. 3; P. 12; C. 12.

Length of head 4·6 and height of body 5·25 in the length. Snout slightly shorter than the diameter of the eye, which is 4·33 in the head. The snout is rounded and the dorsal fin commences at a very short distance behind the head; the lateral line slopes gently downwards, ceasing under the tenth dorsal spine; dorsal joined to the base of the caudal by a membrane.

Colour.—Pale yellow, with two oblique reddish streaks on the preoperculum from the eye backwards.

Hab.—Cook Strait.

As, according to Mr. Hamilton, the type specimen is no longer to be found in the Dominion Museum, and as no other example is known in collections, I have virtually reproduced Hutton's description. This, taken in conjunction with the later published figure, which appears to be only fairly reliable, should render it easy to identify the species when again obtained.

The following discrepancies occur between the description and the figure:—The dorsal fin is represented as arising behind the preopercle, but described as commencing behind the head.

Two ventral rays only are shown, while the lateral line is drawn as continuous, instead of terminating beneath the tenth dorsal spine.

EXPLANATION OF PLATES.

PLATE I.

Tripterygion tripenne Forster.

Nearly twice natural size.

PLATE II.

Tripterygion medium Günther.

Twice natural size.

PLATE III.

Tripterygion varium Forster.

Twice natural size.

PLATE IV.

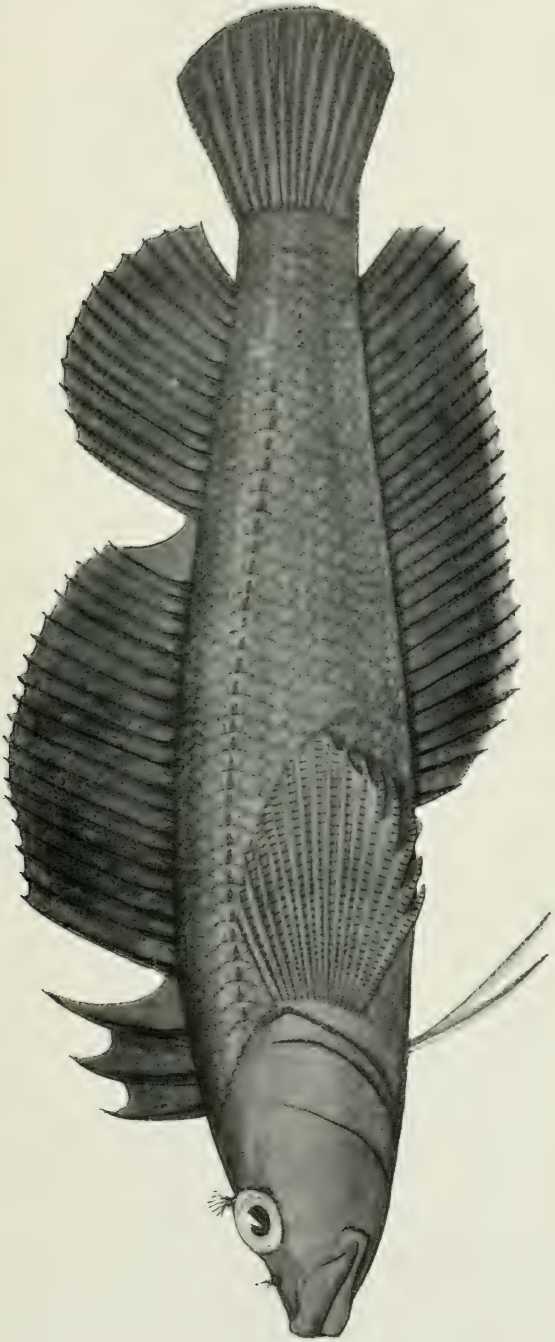
Notoclinus fenestratus Forster.

One-third larger than natural size.

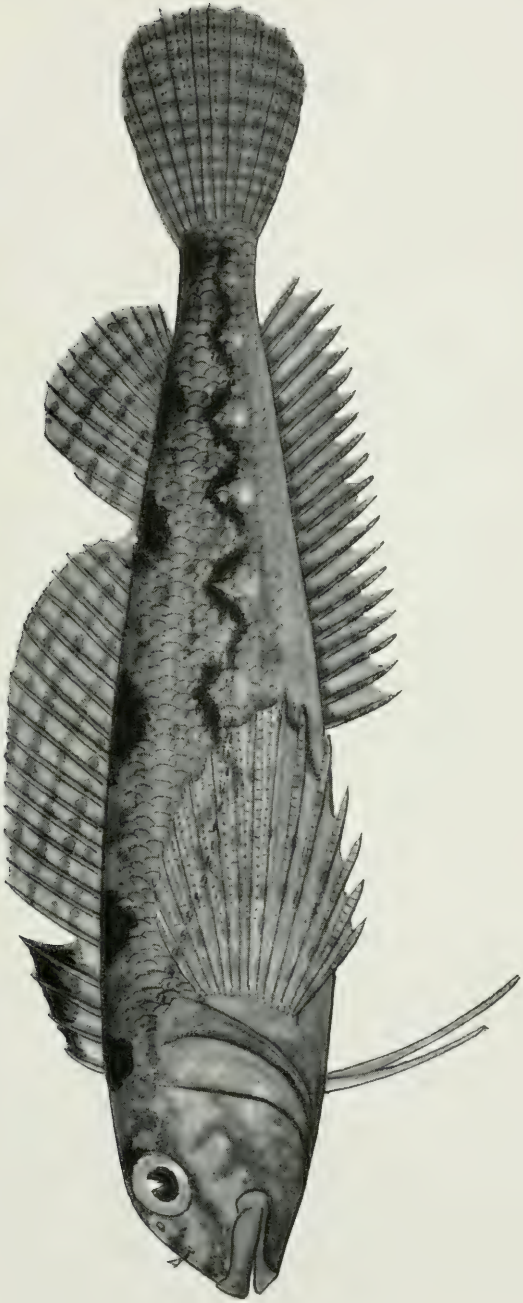
PLATE V.

Ericentrus rubrus Hutton.

Twice natural size.



Edgar R. Waite, del.



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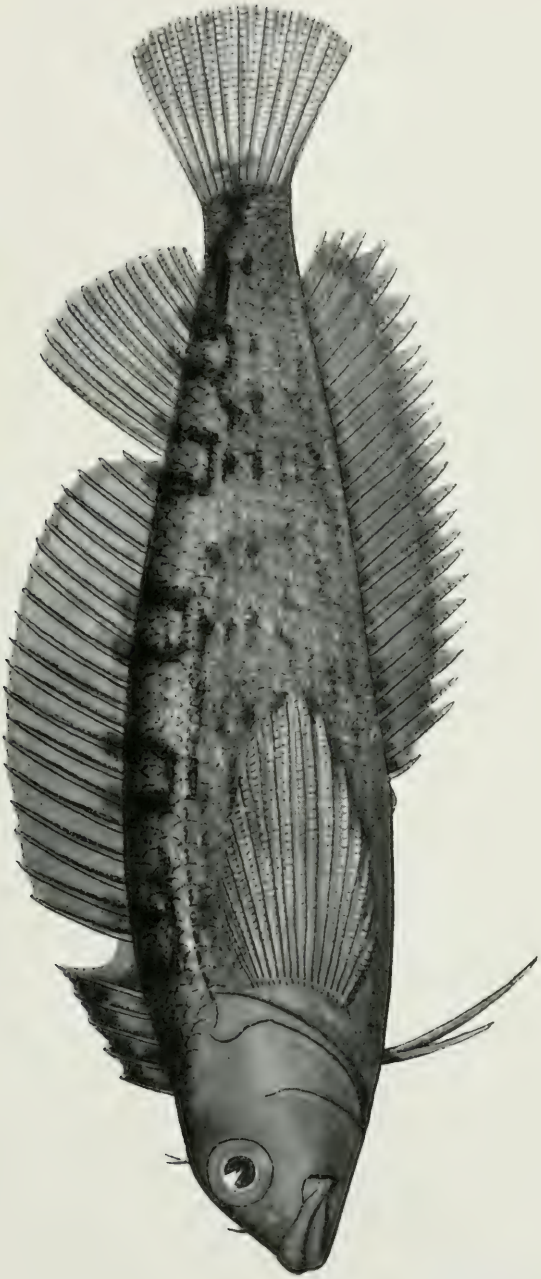

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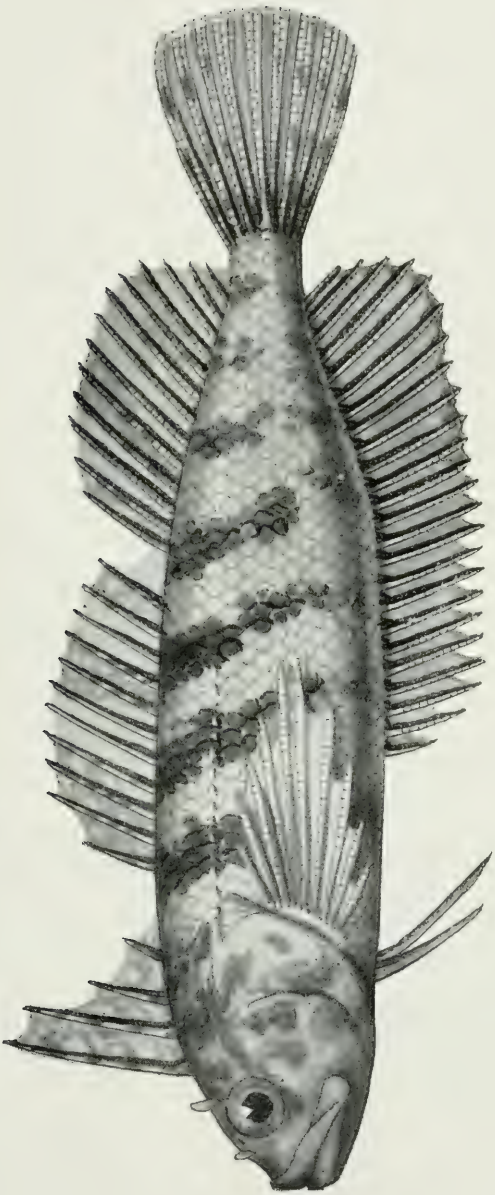

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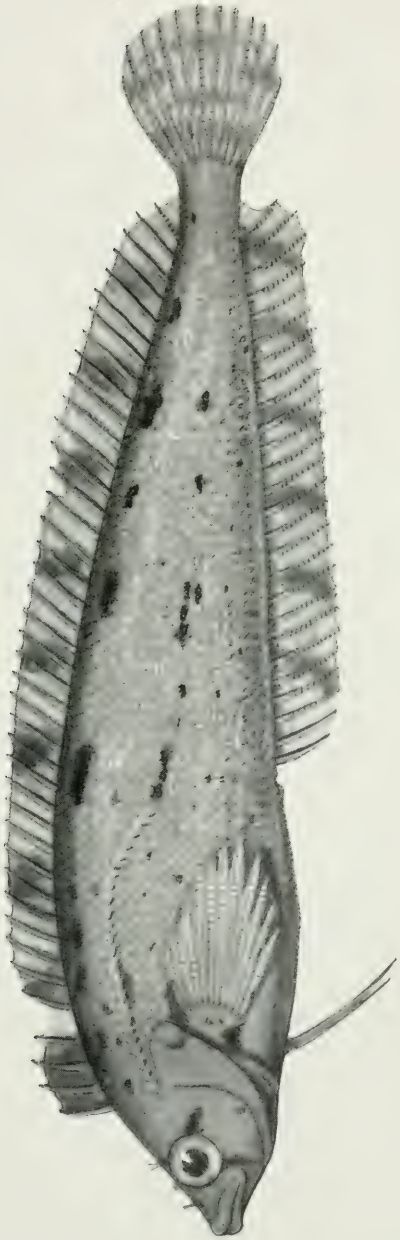

Edgar R. Waite. del.

RESULTS of an EXAMINATION

OF SOME

DRAWINGS of NEW ZEALAND FISHES

By Edgar R. Waite, F.L.S., *Curator.*

Plate VI.

Mr. A. Hamilton, Director of the Dominion Museum, Wellington, placed in my hands for report, some old drawings and photographs of fishes discovered in a portfolio in the Museum. The majority of them are named in the handwriting of Sir James Hector, and call for no special mention, but some of them were not identified, and are of more than passing interest, being unfamiliar forms, of which three are new to the known fauna of New Zealand, namely, *Gempylus serpens* Cuvier and Valenciennes, *Germo germon* Lacépède, and *Luvarus imperialis* Rafinesque.

Mr. T. F. Cheeseman, Curator of the Auckland Museum, also sent me a few photographs, and some of these are likewise referred to below.

Echinorhinus brucus Bonnaterre.

Squalus brucus Bonnaterre, Tabl. Encycl. Ichth., 1788, p. 11.

Echinorhinus spinosus Blainville, Bull. Sci. 1816, p. 121.

This species was first recorded as a member of the New Zealand fauna by Parker,[7] who identified the teeth and tail of a specimen caught off Dunedin in July, 1883.

One of the photographs sent by Mr. Cheeseman represents this species. The subject was stranded at Opotiki in the Bay of Plenty, and the following are supplied as dimensions:—

Length.—8ft. 5in., *girth* 5ft. 6in., *weight* about 3½cwt.

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(7) Parker, T.N.Z.I. xvi. 1884, p. 280.

Plagiogeneion rubiginosus Hutton.

Therapon rubiginosus Hutton, T.N.Z.I. viii. 1876, p. 209.

Plagiogeneion rubiginosus Forbes, *ib.* xxii. 1890, p. 273.

Waite, *ib.* xlv. 1913, p. 218, pl. vii.

A drawing by Miss Nellie Drew of Wanganui, represents this fish. It was sent to Sir James Hector, with a note to the effect that the fish was taken at Kapiti Island in Cook Strait, July 2nd, 1879, and that its colour was silvery pink. The collection also includes a photograph of the same species but without note of any kind.

It might appear that this species is subject to similar conditions which drive the Frost fish (*Lepidopus*) ashore, for all occurrences recorded are in the winter months, and the fish has never been obtained except when stranded. A week after my paper, above noted, was published, namely on June 18th, 1913, Mr. F. W. Armstrong, of New Brighton, brought me a perfect specimen which he had picked up on the beach, and on July 7th Mrs. R. Hartley sent me an example stranded on the beach at Okain's Bay, Banks Peninsula. On July 14th Professor Benham, of the Otago University, wrote to me that he had received a specimen picked up at Moeraki, and he mentions as a curious coincidence that he should have obtained the species, regarded as rare, about the time I had secured the fishes locally, and of which I had apprised him. Mrs. Wilfrid Hall tells me that many years ago she presented a specimen to the Museum taken on the beach at Governor's Bay, Lyttelton Harbour. This is possibly the second specimen referred to in my paper.

Both new specimens in my hands have twelve spines and eleven rays in the dorsal fin, as in the specimen figured. The life colours are really gorgeous, the body being ruby coloured above and silvery beneath, the fins bright crimson.

This fish is allied to *Emmelichthys* but differs, among other details, by being much deeper in the body, and by having the dorsal spines wholly connected by membrane. *Erythrichthys* agrees with the latter in respect to its general proportions but is characterised by having the dorsal spines more or less isolated. *Erythrichthys schlegeli* is said to be an inhabitant of deep water.

Germo germon Lacépède.

Scomber germon Lacépède, Hist. Nat. Poiss. ii. 1800, p. 598 and iii. 1802, p. 1.

Germo germon Fowler, Proc. Acad. Nat. Sci. Phil. 1904, (1905), p. 761 (which see for synonomy).

The drawing is by Mr. G. H. Wilson, Survey Office, Gisborne, and is marked "Bonita, captured by Mr. John Somervell in the Turanganui River, April 13th, 1885." The drawing, in black and white, is stated to be of natural size, and is 478 mm. ($18\frac{3}{4}$ inches) in length. It is made with the care usually taken by survey draughtsmen, and certainly represents a fish of the genus *Germo*. Translating such terms as "back fin and side fin," the following notes are made on the drawing, "Dorsal spines xiv., eight finlets each in dorsal and anal, the pectoral extends to the origin of the anal, the fins fit into grooves and there are no obstructions to movement through the water. The colours are black on the back, graduated to indigo on the sides, belly silvery, shot with tints of golden green, a dark spot on each caudal lobe, scales very fine, small and silken to the touch."

The Long-finned Albacore of the Pacific is usually associated with *Germo alalunga* (*Scomber alatunga* Gmelin) of the Atlantic, but Fowler writes:—"This form has never been compared with the Atlantic fish, in view of which it would seem best to retain Lacépède's name for the Indian form." He adds: "Bennet records a fish from Polynesia, which may probably be identical." I have therefore simply adopted the suggestion without being in a position to offer any opinion on the subject.

Gasterochisma melampus Richardson.

Gasterochisma melampus Richardson, Ann. Mag. Nat. Hist. xv., 1845, p. 346, Waite, T.N.Z.I. xlv. 1913, p. 220, pl. viii.

This species is represented by a photograph sent by Mr. Cheeseman, who informs me that the fish was stranded on the north coast of Gisborne, and was nearly six feet in length.

The specimen was evidently adult and exhibits all the features mentioned in my previous note on the species. Since that was written I find that Mr. David G. Stead, of Sydney, recorded the capture of two specimens at Shoalhaven, New South Wales, in August 1906.[8] They measured respectively 372 and 405 mm. in length, and were thus intermediate in size, between

(8) Pub. Dept. of Fisheries, N.S.W. "Additions No. 1," 1907, p. 21, pl. vi.

those of Richardson and Johnston. The illustration, reproduced from a photograph, which accompanies the paper, shows that although the adult characters have not been attained at that stage, they indicate a further development than the smaller example figured by Richardson. Referring to the great development of the ventral fins in the young, Mr. Stead writes:—"The possession of these relatively enormous ventral fins would appear at first sight to be altogether out of keeping with a fish which is quite obviously pelagic in habit and a rapid swimmer: but when the highly compressed form and somewhat wedge-shaped abdomen are considered, it is seen that if the fish were moving slowly it could hardly retain its balance in the water without the aid of some such organs. Particularly must they be of use if, as is probable, this species subsists to some extent upon slow-moving pelagic organisms. Of course, in rapid swimming, the ventral fins would be laid back in their groove."

One may inquire how the adult, in which the ventral fins are so greatly reduced, succeeds in balancing itself in the water?

I should have mentioned, as Mr. Stead has done, that the identity of *Gasterochisma* and *Lepidothynnus* was first promulgated by Regan[9].

Gempylus serpens Cuvier and Valenciennes.

Gempylus serpens Cuvier and Valenciennes, Hist. Nat. Poiss. viii. 1831, p. 207.

The drawing is marked "Scabbard Fish," and consists of the head and fore part of the body, and a smaller sketch of the entire fish, which is described as scaleless, and 3ft. 5in. (1042 mm.) in length. No specific locality is mentioned, but the specimen was evidently obtained in fresh condition, for the sheet also contains drawings of a live leech-like parasite attached to the fish, and described as follows:—"This sac contains a blood-red fluid, which is in constant motion, ebbing to and fro without the sac itself undergoing any change of form."

Luvarus imperialis Rafinesque.

Plate VI.

Luvarus imperialis Rafinesque, Caratt. Alc. Gen. 1810, p. 22.

Waite, Rec. Aust. Mus. iv. 1902, p. 292, pl. xlv, xlvi.

Originally known from the Mediterranean and Atlantic, this species was first recorded from the Pacific in 1901 by Mr. C. F.

(9) Regan Ann. Mag. Nat. Hist. (Ser. 7) x. 1902, p. 120.

Holder, who published a photograph of a specimen taken at Avalon on Santa Catalina Island, off the coast of California.

In the following year I identified a specimen stranded at Bermagui on the coast of New South Wales. It would seem, however, that Mr. Holder's specimen did not present the first opportunity for recording the species from the Pacific, for one of the drawings sent by Mr. Hamilton portrays this fish. The picture is in outline, drawn with pen and ink, and bears the following words, "Cast on beach near North Cape, North Island, 1887." The drawing measures 650 mm. (25½ inches), but if to scale may be but half or even only one-third the actual size of the specimen, the retrogression of the dorsal spines indicating a mature or aged example. The drawing of Rafinesque's type specimen shows the dorsal and anal fins as originating in the same vertical, a condition of the Australian example also. In the figure published by Goode and Bean[10] two dorsal spines are shown in advance of the anal, whereas in the drawing of the New Zealand fish, the origin of the first dorsal spine is posterior to the third of the anal. Though the anal fin also suffers regression it is evidently affected to a lesser degree than is the dorsal.

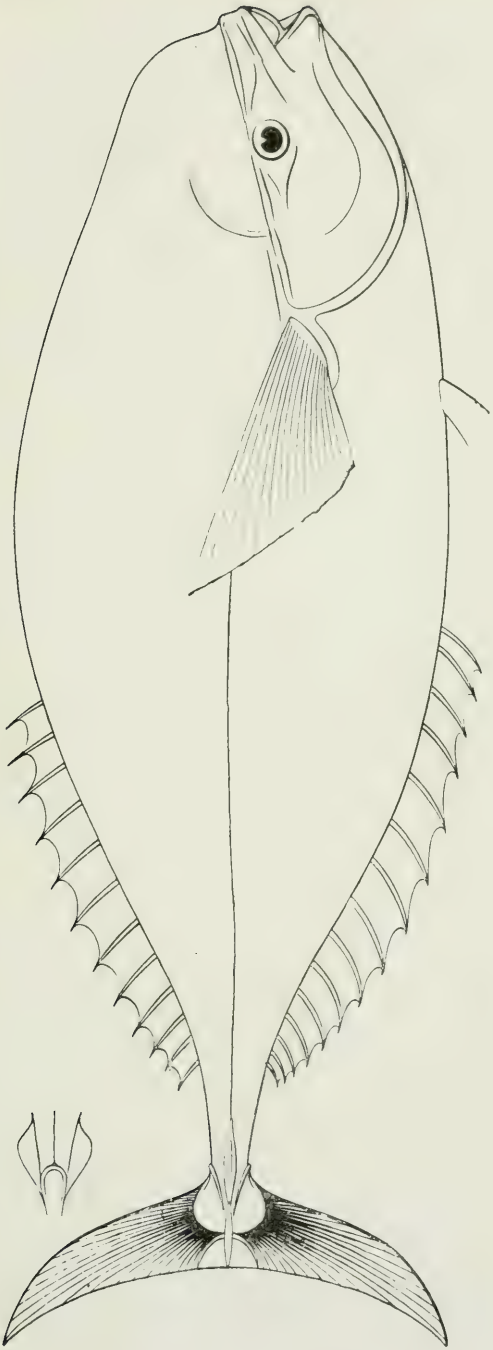
The drawing is rather diagrammatic but has been carefully done, and it is reproduced herewith, artist C.H.P.

EXPLANATION OF PLATE VI.

Luvarus imperialis Rafinesque.

Greatly reduced from a drawing by "C.H.P."

(10) Goode and Bean, Oceanic Ichth. 1895, pl. lxiv., fig. 230.



C.H.P. del.

A SUPPOSED OCCURRENCE OF THE BOTTLE-NOSED WHALE *(HYPEROODON)* IN NEW ZEALAND

By Edgar R. Waite, F.L.S., Curator.

Plates VII. and VIII.

In the "Guide Book to the Whales and Dolphins of New Zealand" I noted that *Hyperoodon* had been recently recorded from New Zealand[11], but that, at the time of writing details were not to hand.

I now learn that the specimen was found stranded by my friend, Captain John Bollons, of the Government steamer *Hinemoa*, who has placed in my hands the extremity of the mandible, which he had sawn off. He supplies the following particulars of this occurrence, and if the determination is correct another species is added to our known fauna. The bottle-nosed whale was found stranded on the beach at East Cape (the most easterly point of New Zealand), and was twenty-five feet in length. The lower jaw measured two and a half feet, and the teeth were imbedded half an inch below the gum. The specimen was in a considerably decayed condition when discovered, and the tip of the mandible was the only portion of the animal preserved.

I have previously referred to Captain Bollons's interest in, and knowledge of, marine life, and he not only identified the whale from external appearance, but took pains to secure one of its most characteristic features. The record above mentioned appeared in the newspapers on information supplied by Captain

(11) Guide Book, Canterbury Museum, 1912, p. 15, footnote.

Bollons, who stated that the Whale had been discovered stranded, during his periodic visit to the lighthouses on the New Zealand coast.

The characteristic features of the Ziphioid or Beaked Whales, hitherto recorded from New Zealand, are so pronounced that there is small difficulty in determining to what genus any specimen should be assigned, providing, of course, that the peculiar diagnostic features of the individual are preserved.

Though the specimen now under notice consists only of a small portion of the mandible, it can be definitely said that it is referable neither to *Berardius* or *Mesoplodon*, but possesses characters, generally speaking, common to *Ziphius* and *Hyperoodon*, that is, there is only one pair of teeth in the mandible and these teeth are situated at the extremity of the jaw.

In the absence of specimens of both genera for comparison, accurate determination may be impossible, but for reasons adduced below, I am inclined to consider the bone referable to *Hyperoodon*.

The specimen preserved by Captain Bollons consists of a small piece of the anterior portion of the mandible, 115 mm. in length, the greatest width, at the sawn surface being 70 mm. Viewed from above or below the extremity is trilobed, the middle lobe being the longest, and separated from the lateral ones by two pits, from which the tusk-like teeth project. The teeth lie almost parallel to each other, are slightly curved and are inclined upwards and forwards, forming an angle of about 40 degrees with the axis of the bone. They are cemented in their sockets by a greyish-white coloured substance. The left tooth is slightly the longer, and projects 37 mm. beyond its insertion though only 23 mm. beyond the level of the median lobe. The exposed portion of the tooth is nearly circular in section, its greatest, or antero-posterior diameter being 13 mm. at its insertion. The terminal 5 mm. is composed of enamel, of which the distal half is contracted to form a nipple-like tip.

The alveolar groove extends along the outer upper edge of each ramus, and the irregularly disposed pits are supposed to have held teeth in fœtal or early life. On the underside of the mandible, and towards its tip are three pairs of orifices, the outlets of the dental canal, seen in the middle of each lateral half of the sawn surface, and shown in the photograph (Pl. VII.).

Removed from its socket, the left tooth is found to be 67 mm. in length, of which nearly half is imbedded in the bone and coated with cement. This cement closely invests the root of the

tooth, and the irregular nature of its outer surface corresponds with the irregularity of the interior of the socket. (Pl. VIII., fig. 2.)

The somewhat extensive literature on *Hyperoodon* and *Ziphius* does not help one who has but the fragment of a mandible, to any extent. The genera agree in that the lower jaw has a pair of teeth at or near the extremity of the mandible. Owen[12] figured the teeth and extremity of the lower jaw of an immature *Hyperoodon*, and thus described the teeth:—"They are conical, slightly curved, with an unusually sharp and slender apex, tipped by enamel. Though loose in their sockets, they project so little from them, and have such wide bases that they are retained in *situ*, and do not fall out in the dried jaw; two smaller cavities in front, and the remains of a larger socket in the alveolar groove, behind the retained teeth, attest the former presence of other teeth."

Owen's drawing exhibits a great similarity to our specimen, in which, however, the teeth are larger, and are placed terminally, those pictured by Owen being situated some distance behind the apex, though said to be at the extremity. The difference in the position of the teeth may be due to the instability of degenerate characters, or may be merely a question of age. The small cavities in front which Owen considered to be the sockets of previously existing teeth, are not present in our specimen unless they can be identified with what I have supposed to be an anterior branch of the canal.

The teeth of *Hyperoodon* appear to be considerably larger than those of *Ziphius*, being, according to van Beneden[13] a decimeter in length, the root included, while those of *Ziphius cavirostris*, according to the same author, are but 47 mm. long, or less than half those of *Hyperoodon*.

The Bottle-nosed Whale is a common northern species, and has been frequently cast on to British coasts. Though usually known as *Hyperoodon rostratum* Muller, True[14] dates the first diagnosis to Forster (1770), the name being therefore *H. ampullatus*. It is, however, more probable that our specimen should be referred to *H. planifrons* Flower[15] described from a water-worn cranium found at Lewis Bay, Dampiere's Archipelago, N.W. Australia. *H. ampullatus* has not been identified from southern waters, but True supplies the following localities

(12) Owen, Odontography, 1840-45, p. 347, pl. lxxxviii., fig. 1.

(13) Van Beneden and Gervais, Ostéographie des Cétacés 1880, p. 373.

(14) True, U.S. Nat. Mus. Bull., 73, 1910, p. 76.

(15) Flower, P.Z.S., 1882, p. 392.

for *H. planifrons*, some of which are, however, represented by fossil specimens:—Indian and Pacific Oceans; Lewis Island, Australia; Province of Buenos Ayres, Argentina, and territories of Chubut and Santa Cruz, Patagonia.

EXPLANATION OF PLATES.

Plate VII.

? *Hyperoodon planifrons* Flower.

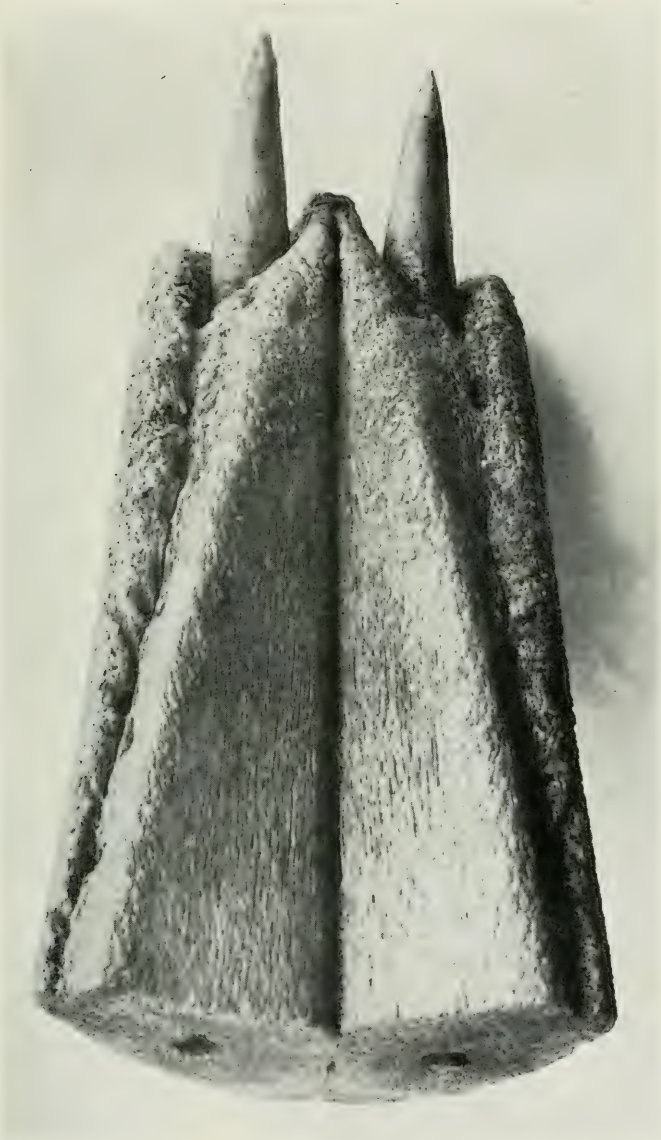
Extremity of mandible, seen from above, natural size.

Plate VIII.

? *Hyperoodon planifrons* Flower.

Fig. 1.—Extremity of mandible, in profile, natural size.

Fig. 2.—Tooth removed from socket, natural size.



Leslie Hinge, photo.

Leslie Hinge, photo.

LIST OF TERTIARY MOLLUSCA

IN THE

CANTERBURY MUSEUM

By R. Speight, M.A., M.Sc., F.G.S. Assistant Curator.

In view of the efforts now being made by the Geological Survey and by private individuals to place the evidence for the subdivision of the Tertiary geological series in this country on a better footing, it has been considered advisable to publish a list of the specimens in this Museum, with the localities from which they have been obtained. Such a list will no doubt assist workers elsewhere who may wish to know what the Museum really possesses. The collection is, besides, a most important one, as it contains the fossils originally gathered by von Haast in the classic localities situated within the province of Canterbury; and also much of the material dealt with by Hutton, both before and during the time he filled the position of Curator of this Museum. This material has been derived from such well-known districts as Waipara and the Weka Pass; the Greta and Waikari Valleys; the Trelissick Basin, the home of J. D. Enys, a keen collector, whose labours have enriched the institution in numerous ways; the Curiosity Shop; Kakahu; and especially the rich horizons of Pareora, Waihao, and Mount Harris. These areas probably include some of the most noteworthy fossiliferous Tertiary localities in New Zealand. Numerous specimens have also been added to the collection from the rich Pliocene beds of Wanganui and Hawke's Bay.

In compiling this list, the author has received very substantial assistance from Mr. Henry Suter, who has lately overhauled the collection of recent Mollusca displayed in the Museum, and the classification adopted in his "Manual"[16] has been followed throughout; for his generous help on many occasions our thanks are specially due.

(16) Suter, Manual of N.Z. Mollusca, 1913.

It has not been thought advisable at the present time to do more than give a localised list, since a much greater mass of material must be obtained from numerous localities, and collected with due regard to zonal distribution, before any satisfactory attempt at generalisation can be made, without incurring the danger of falling into serious error.

It is necessary to note that it has been considered advisable in one or two cases to select types where none were previously indicated. There can be no doubt that the material on which Hutton founded his new species described in Trans. of the N.Z. Institute, vol. IX., pp. 593-8, is still in the Museum and can be easily identified, and the types have been selected from this. Owing to the very numerous changes in nomenclature it has not been considered necessary to include the author's name in brackets when his species has been assigned to a different genus.

The number of specimens of each individual species in the collection from a particular locality is indicated by a figure in brackets following the name of the locality. One or two of these names are now difficult to assign to their proper district since place-names well known once have at times disappeared from maps and from the remembrance of settlers. Where possible a more precise indication of the locality is given. This applies to such names as Double Corner, an old abandoned station near the Lower Waipara Gorge, and also such misleading names as White Rock, which is the name of a well-known limestone quarry in North Canterbury and also of an important locality in South Canterbury, where numerous typical Pareora fossils have been obtained.

The following is a list of works of special importance in considering the synonomy of the species of New Zealand Tertiary fossil Mollusca.

"An Account of New Zealand, etc.," by Rev. William Yate. London, 1835.

An appendix to this work contains a list of shells described by Gray.

"Voyage de *l'Astrolabe*, vol. ii., Zoologie—Mollusca," by Quoy and Gaimard. Paris, 1832-5.

"Voyage de la *Coquille*—Zoologie," by Lesson and Garnot. Paris, 1826.

"New Zealand," by Dieffenbach.—Description of the Fauna by Gray. London, 1843.

"Geological Observations in South America," by Darwin.—Descriptions of Mollusca by Sowerby. London, 1846.

"Reise der Novara—Geologie, vol. ii., Pal.," by Zittel. Vienna, 1864.

"Catalogue of the Marine Mollusca of New Zealand," by Hutton. Wellington, 1873.

"Catalogue of the Tertiary Mollusca of New Zealand, by Hutton. Wellington, 1873.

"Pliocene Mollusca of New Zealand—Macleay Memorial Volume," by Hutton. Sydney, 1893.

"Mollusca of the Pareora and Oamaru Systems," by Hutton. Proc. Linn. Soc., N.S. Wales, i. (2nd Series). Sydney, 1887.

The following volumes of the Transactions of the N.Z. Institute contain descriptions of new species of Tertiary Mollusca, namely:—vii., ix., xv., xvii., xviii., xxxiv., xxxvii., by F. W. Hutton; xii., xiv., by T. W. Kirk; xxxii., xxxvii., by R. Murdoch; xl, xliii., xlv., by Henry Suter; and xl., by J. Allan Thomson.

PTEROPODA.

Fam. Cavolinidae.

Vaginella aucklandica Clarke (?); T.N.Z.I., xxxvii., 1905, p. 419, pl. xxxii, fig. 5.
Weka Pass.

GASTEROPODA.

Fam. Trochidae.

Trochus nodosus Hutton; T.N.Z.I., xvii., 1885, p. 330.
Broken River. (Idio-type.)

Trochus tiaratus Quoy and Gaimard; Voy. Astrol., iii., 1834, p. 256, pl. lxiv., figs. 6-11.
Waipara (3); Lower Gorge of Waipara.

Trochus (Coelotrochus) conicus Hutton; T.N.Z.I., xv., 1883, p. 411.
Wanganui. (Type.)

Trochus sp.
Whitewater Creek, Trelissick Basin.

Ethalia zelandica Hombron and Jacquinot, Voy. Pôle Sud, v., 1854, p. 53, pl. xiv., figs. 5, 6.
Wanganui (2).

Callistoma spectabile Adams; P.Z.S., 1854 (1855), p. 37, pl. xxvii., fig. 7.
Broken River (4).

Callistoma hodgei Hutton; T.N.Z.I., vii., 1875, p. 458, pl. xxi.
Wanganui. This has been marked "type" by Hutton, but Mr. Suter notes that it cannot be the type, which is a somewhat larger example in the Otago Museum. See T.N.Z.I., vii., 1875, p. 458.

Callistoma ponderosum Hutton; T.N.Z.I., xvii., 1885, p. 322.
Wanganui. (Type.)

Fam. Turbinidae.

Turbo marshalli Thomson; T.N.Z.I., xl., 1908, p. 103, pl. xiv., fig. 6.
Tuffs below limestone, Kakanui.

Turbo superbus Zittel: Reise Novara, Geol. ii. Pal., 1864, p. 39, pl. xiv., fig. 2.
Porter River (4).

Astraea heliotropium Martyn; Univ. Conch., i., 1784, fig. 30 (not of 1769.)
Wanganui.

Fam. Rissoidae.

Rissoa olivacea Hutton; T.N.Z.I., xiv., 1882, p. 147, pl. i., fig. K, 1-4.
Petane (6).

Rissoa gradata Hutton; T.N.Z.I., xvii., 1885, p. 321, pl. xviii., fig. 21.
Wanganui (Lecto-type).

Rissoina rugulosa Hutton; Cat. Mar. Moll., 1873, p. 28.
Petane.

Rissoa impressa Hutton; T.N.Z.I., xvii., 1885, p. 321.
Petane (Lecto-type).

Rissoa (Alvania) rugosa Hutton; T.N.Z.I., xvii., 1885, p. 321.
Petane (Lecto-type).

Rissoina (Zebina) emarginata Hutton; T.N.Z.I., xvii., 1885, p. 320, pl. xviii., fig. 20.
Wanganui (Type).

Rissoa (Onobia) semisulcata Hutton; T.N.Z.I., xvii., 1885, p. 321.
Wanganui (Lecto-type).

Fam. VERMETIDAE.

Serpulorbis zelandicus Quoy and Gaimard; Voy. Astrol., iii., 1834, p. 293, pl. lxvii., figs. 16, 17.
Wanganui.

Serpulorbis sipho Lamarck; Anim. s. Vert. v., 1818, p. 626.
(= *Cladopoda monilifera* Hutton; Cat. Tert. Moll. p. 13.)
Wanganui.

Fam. TURRITELLIDAE.

Turritella pagoda Reeve; Conch. Icon., v., fig. 60.
Te Ngawai; White Rock River (10).

Turritella cavershamensis Harris; Cat. Tert. Moll. Brit. Mus., part I., 1897, p. 242.
White Rock River (2); Pareora River (2). Another fine specimen has no locality indicated.

Turritella carlotta Watson; Journ. Linn. Soc., xv., 1881, p. 222, (= *T. vittata* Hutton).
Wanganui.

Turritella rosea Quoy and Gaimard; Voy. Astrol., iii., 1834, p. 136, pl. lv., figs. 24-26.
var. *A.* of Hutton, White Rock River (4); Blue Cliffs, Otaio, (2); Mount Harris (2); Point Hill, Waitaki (3); Motunau (3); Greta (3); Westland (3); Wanganui (2).

Turritella bicincta Hutton; Cat. Tert. Moll. 1873, p. 13.
Petane (5).

Turritella symmetrica Hutton; Cat. Mar. Moll., 1873, p. 30.
Greta (3); Porter River (7); White Rock River (6); Lower Gorge of the Waipara River (3); Wanganui (2).

Eglisia striolata Hutton; T.N.Z.I., xvii., 1885, p. 329.
White Rock River (Holotype and fourteen paratypes).

Eglisia planostoma Hutton; T.N.Z.I., xvii., 1885, p. 320, pl. xviii., fig. 19.
Petane (Type).

Fam. STRUTHIOLARIIDAE.

Struthiolaria cincta Hutton; Cat. Tert. Moll., 1873, p. 11.
Waikari; Greta (2); Lower Gorge of Waipara.

Struthiolaria frazeri Hutton; T.N.Z.I., xvii., 1885, p. 329.
Motunau.

Struthiolaria vermis Martyn; Univ. Conch., ii., 1784, fig. 53.
var. *A.* Matapiro, Hawke's Bay; Woodville; var. *B.* Wanganui (2).

Struthiolaria (*Pelicaria*) *obesa* Hutton; T.N.Z.I., xvii., 1885, p. 329.
Shepherd's Hut, Waipara (Type); Porter River.

Struthiolaria parva Hutton; M.S., Suter.
(Chiro-type). Locality unspecified.

Struthiolaria cingulata Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 35, pl. xv., fig. 2.
Porter River; Motunau; Mount Harris; Lower Gorge of Waipara.

Struthiolaria tuberculata Hutton; Cat. Tert. Moll., 1873, p. 11.
Pareora; Waikari; Lower Gorge of Waipara.

Struthiolaria spinosa Hector; T.N.Z.I., xviii., 1886, p. 335.
Waikari; Broken River (2); Kakahu.

Struthiolaria calcar Hutton; T.N.Z.I. xviii., 1886, p. 335.
Te Ngawai Cliff.

Struthiolaria papulosa Martyn; Univ. Conch., ii., 1784, fig. 54.
Wanganui; Pareora.

Struthiolaria caniculata Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 34, pl. xv., fig. 1.
Lower Gorge of Waipara.

Fam. CALYPTRAEIDAE.

Crepidula gregaria Sowerby; in Darwin's "Geol. Obs. S. Amer.," 1846, p. 254, pl. iii., fig. 34.
Pareora (2); Motunau (2); Waikari (4).

Crepidula crepidula Linné; Mus. Lud. Ulricae, 1764, p. 639.
Porter River (4); White Rock River (2); Wanganui (5).

Crepidula aculeata Gmelin; Syst. Nat., ed. 13, 1789, p. 3693.
Broken River; Wanganui (2).

Calyptraea maculata Quoy and Gaimard; Voy. Astrol., iii., 1835, p. 422, pl. lxxii., figs. 6-9.
Wanganui (3); Porter River (2).

Calyptræa maculata inflata Hutton; T.N.Z.I., xv., 1883, p. 411.
Wanganui (Type).

Calyptræa alta Hutton; T.N.Z.I., xvii., 1885, p. 329.
Petane (Lecto-type); White Rock River.

Calyptraea scutum Lesson; Voy. Coquille, Zool. xi., 1830, p. 395.
Waikari; Puketapu, Napier; Wanganui; Point Hill, Waitaki (4); Lower Gorge of Waipara.

Fam. NATICIDAE.

Polinices (*Lunatia*) *suturalis* Hutton; T.N.Z.I., ix., 1877, p. 597, pl. xvi., fig. 11.
Awamoa; Waitaki; Mount Horrible, Pareora; Waihao.

Polinices ovatus Hutton; Cat. Tert. Moll., 1873, p. 9.
Broken River; Pareora; Waikari; White Rock River; Lower Gorge of Waipara.

Polinices gibbosus Hutton; T.N.Z.I., xviii., 1886, p. 334.
Broken River (Type); Pareora; White Rock River; Waihao.

Polinices huttoni v. Ihering; Anal. Mus. Nat. Buenos Aires, xiv., 1907, p. 154, pl. v., fig. 16 (= *N. solida* Sowerby; Darwin's Geol. Obs. on S. America, p. 255).
Fox's Gully; Arahura River; Lower Gorge of Waipara.

Polinices (*Lunatia*) *cinctus* Hutton; T.N.Z.I., xvii., 1885, p. 318, pl. xviii., fig. 12.
Wanganui (Type).

Polinices laevis Hutton; T.N.Z.I., xvii., 1885, p. 317, pl. xviii., fig. 10.
Petane (Type); Wanganui.

Natica australis Hutton; Jour. de Conch., xxvi., 1878, p. 23.
Wanganui; Porter River; White Rock River.

Natica zelandica Quoy and Gaimard; Voy. Astrol., ii., 1832, p. 237, pl. lxvi., fig. 11-12.
White Rock River; Wanganui.

Ampullina miocœnica Suter; N.Z. Geol. Survey., Paleont. Bulletin No. 2, part 1., 1913, p. 21, pl. ii., fig. 2.
(= *Sigaretus sub-globosus* Hutton *non* Sowerby).
White Rock River (2); Te Ngawai.

Ampullina undulata Hutton; T.N.Z.I., xvii., 1885, p. 318, pl. xviii., fig. 11.
Wanganui (Type).

Fam. CYPRAEIDAE.

Cypraea ficoides Hutton; Cat. Tert. Moll., 1873, p. 8.
Oamaru (2).

Cypraea ovulatella Tate; T.R.S. S. Austr., xiii., 1890, p. 208, pl. vi., fig. 7 (= *Marginella ventricosa* Hutton).
Porter River.

Trivia zealandica T. W. Kirk; T.N.Z.I., xiv., 1882, p. 409.
Petane (6).

Fam. Septidae.

Cymatium spengleri Chemnitz; Conch. Cal., xi., 1795, p. 117, pl. cxi., figs. 1839-40.
Wanganui; Greta.

Cymatium minimum Hutton; Cat. Tert. Moll., 1873, p. 5.
White Rock River (2).

Fam. Cassididae.

Phalium orchatinum pyrum Lamark; Anim. sans vert., vii., 1822, p. 226.
Wanganui.

Galeodea sulcata Hutton; Cat. Tert. Moll., 1873, p. 8.
Pareora (3); Lower Gorge of Waipara; Fox's Gully, Arahura.

Galeodea senex Hutton; Cat. Tert. Moll., 1873, p. 11.
Oamaru; Curiosity Shop, Rakaia; Pareora; Lower Gorge of Waipara.

Fam. Epitoniidae.

Epitonium (*Cirsotrema*) *zelebori* Dunker; Verh. Zool. Bot. Gesellsch. xvi., 1866, p. 912.
White Rock River; Wanganui.

Epitonium (*Cirsotrema*) *marginatum* Hutton; T.N.Z.I., xvii., 1885, p. 330.
Curiosity Shop (Type).

Epitonium (*Cirsotrema*) *nympha* Hutton; T.N.Z.I., xvii., 1885, p. 321.
Petane (Type).

Epitonium (*Cirsotrema*) *rotundum* Hutton; Cat. Tert. Moll., 1873, p. 10.

Epitonium (*Cirsotrema*) *rugulosum lyratum* Zittel; Voy. Novara, Geol. ii., Pal., 1864, p. 41, pl. ix., fig. 8.
Lower Gorge of Waipara (2); Curiosity Shop.

Epitonium (*Cirsotrema*) *browni* Zittel; Voy. Novara, Geol. ii., Pal., 1864, p. 42, pl. ix., fig. 9.
Opihi; White Rock River (2).

Lissospira corulum Hutton; T.N.Z.I., xvii., 1885, p. 322, pl. xviii., fig. 22.
Wanganui (Type).

Fam. Pyramidellidae.

Eulimella media Hutton; T.N.Z.I., xvii., 1885, p. 318, pl. xviii., fig. 13.
Wanganui (Type).

Eulimella deplexa Hutton; T.N.Z.I., xvii., 1885, p. 318.
Wanganui (Type).

Turbonilla zealandica Hutton; Cat. Mar. Moll., 1873, p. 22.
Wanganui.

Odostomia georgiana Hutton; T.N.Z.I., xvii., 1885, p. 319, pl. xviii., fig. 16.
Wanganui (Type).

Odostomia rugata Hutton; *O. plicata* Hutton; T.N.Z.I., xvii., 1885, p. 319, pl. xviii., fig. 17.
Wanganui (Type); White Rock River.

Odostomia huttoni Suter; T.N.Z.I., xl., 1908, p. 368 (= *O. fasciata* Hutton *non* Dunker).
Wanganui (Type).

Odostomia sherriffii Hutton: T.N.Z.I., xv., 1883, p. 411.

Odostomia sp.?
White Rock River.

Aclis costellata Hutton; T.N.Z.I., xvii., 1885, p. 319, pl. xviii., fig. 14.
Wanganui (Type).

Fam. Eulimidae.

Eulima treadwelli Hutton; T.N.Z.I., xvii., 1885, p. 318 (= *E. micans* Hutton, not of Tenison Woods).
Wanganui (Type).

Eulima (*Arcuella*) *obliqua* Hutton; T.N.Z.I., xvii., 1885, p. 318.
Petane (Type).

Fam. Fasciolaridae.

Fusinus spiralis A. Adams; Proc. Zool. Soc., 1855 (1856), p. 221.
Wanganui (2); Waikari.

Fusinus spiralis dentatus Hutton; T.N.Z.I., ix., 1877, p. 594.
Mount Harris (Holotype).

Fusinus tegens Hutton; T.N.Z.I., ix., 1877, p. 594.
White Rock River (Holotype).

Latirus brevirostris Hutton; T.N.Z.I., ix., 1877, p. 596, pl. xvi., fig. 10.
White Rock River (Holotype).

Latirus huttoni Suter; T.N.Z.I., xl., 1908, p. 369, pl. xxx., fig. 3. (= *Taron dubius* Hutton).
Wanganui.

Fam. Mitridae.

Mitra inconspicua Hutton; T.N.Z.I., xvii., 1885, p. 326.
Mount Harris (Holotype and one paratype); Waihao.

Mitra (Cancilla) hectori Hutton; T.N.Z.I., xxxvii., 1905, p. 473, pl. xliv., fig. 2.
Waihao, near Coal-mine (Holotype).

Mitra enysi Hutton; Cat. Tert. Moll., 1873, p. 7.
Pareora.

Vexillum apicale Hutton; Cat. Tert. Moll., 1873, p. 7.
Awamoa; Pareora.

Vexillum marginatum Hutton; T.N.Z.I., xvii., 1885, p. 315, pl. xviii., fig. 4.
Wanganui (Holotype).

Vexillum linctum Hutton; T.N.Z.I., xvii., 1885, p. 326.
Petane (Holotype).

Vexillum rubiginosum Hutton; Cat. Mar. Moll., 1873, p. 20.
Petane.

Vexillum planatum Hutton; T.N.Z.I., xvii., 1885, p. 315, pl. xviii., fig. 3.
Petane.

Fam. Chrysodomidae.

Siphonalia caudata Quoy and Gaimard; Voy. Astrol., ii., 1833, p. 503, pl. liv., figs. 20, 21.
Wanganui; Greta.

Siphonalia dilatata Quoy and Gaimard, Voy. Astrol., ii., 1833, p. 498, pl. xxxiv., figs. 15-16.
Mount Harris; White Rock; Pareora; Kakahu; Waikari.

Siphonalia nodosa Martyn; Univ. Conch., i., 1784. *Buccinum*, fig. 5.
Wanganui.
var. *B.* Hutton; Wanganui; Goldsborough, Westland (2); Waihao.
var. *conoidea* Hutton; Matapiro; Greta; Arahura.

Siphonalia subnodosa Hutton; T.N.Z.I., ix., 1877, p. 596, pl. xvi., fig. 7.
White Rock River; Waikari (2).

Siphonalia costata Hutton; T.N.Z.I., ix., 1877, p. 594, pl. xvi., fig. 2.
Mount Harris; Mount Horrible.

Siphonalia orbita Hutton; T.N.Z.I., xvii., 1885, p. 326.
Greta (Type); Lower Gorge of Waipara River.

Siphonalia mandarina Duclos; Mag. de Zool., 1831, p. 8.
Wanganui (3).

Siphonalia regularis Sowerby (?); Darwin's "Geol. Obs. in S. America," p. 258, pl. iv., fig. 55.
Awamoa; Pareora.

Siphonalia sp.?
White Rock River.

Euthria drewi Hutton; T.N.Z.I., xv., 1883, p. 410.
Wanganui (Type).

Euthria linea Martyn; Univ. Conch., ii., 1784. *Buccinum*, fig. 48.
Wanganui (2).

Euthria linea traversi Hutton; Cat. Mar. Moll., 1873, p. 9.
Greta; Wanganui (2).

Euthria striata Hutton; T.N.Z.I., vii., 1875, p. 458, pl. xxi.
Wanganui (2).

Euthria media Hutton; T.N.Z.I., xvii., 1885, p. 326.
Waikari (Holotype and two paratypes).

Euthria martensiana Hutton; Journ. de Conch., xxvi., 1878, p. 16.
Wanganui.

Euthria sp.?
White Rock River.

Fam. Buccinidae.

Cominella maculata Martyn; Univ. Conch. *Buccinum*, ii., 1784, fig. 49.
White Rock River; Shepherd's Hut, Waipara; Porter River, Trelissick Basin; Matapiro, Hawke's Bay.

Cominella nassoides Reeve; Conch. Icon., iii., *Buccinum*, fig. 12.
Petane.

Cominella huttoni Kobelt: Jahrb. d. Deutsch. Mal. Ges., 1878. p. 233 (= *C. hamiltoni* Hutton; T.N.Z.I., xvii., 1885. p. 316, pl. xviii., fig. 7.
Petane (6); Porter River.

Cominella virgata H. and A. Adams; Gen. of Moll., i., 1853. p. 110, iii., pl. xi., fig. 6.
Wanganui.

Cominella monilifera Hutton; T.N.Z.I., xvii., 1885, p. 327.
Waipara (Type).

Cominella acuminata Hutton; Pliocene Moll. of N.Z., p. 43, pl. vi., fig. 14; *C. elongata* Hutton; T.N.Z.I., xvii., 1885. p. 315, pl. xviii., fig. 5; not of Dunker.
Wanganui (Lecto-type and two paratypes).

Cominella lurida Philippi; Zeitschr., f. Malak. 1848, p. 137.
Wanganui.

Cominella costata Quoy and Gaimard; Voy. Astrol., ii., 1833, p. 417, pl. xxx., figs. 17-18.
Cheviot.

Cominella inflata Hutton; Cat. Tert. Moll. 1873, p. 6.
Mount Horrible; Porter River.

Phos cingulatus Hutton; T.N.Z.I., xvii., 1885, p. 327.
Greta (Holotype and two paratypes).

Phos incisus Hutton; T.N.Z.I., xvii., 1885, p. 328.
Te Aute (Type).

Alectrion socialis Hutton; T.N.Z.I., xviii., 1886, p. 333; *Nassa compta* Hutton, *l.c.* ix., 1877, p. 596, pl. xvi., fig. 9.
White Rock River (Holotype); Awamoa.

Fam. Muricidae.

Typhis maccoyi J. Ten. Woods; Pap. Roy. Soc. Tasm., 1875, p. 22, pl. i., fig. 5 (= *T. hebetatus* Hutton).
Mount Harris (4).

Murex zelandicus Quoy and Gaimard; Voy. Astrol., Zool. ii., 1833, p. 529, pl. xxxvi., figs. 5-7.
Mount Harris; Wanganui (3).

Murex octogonus Quoy and Gaimard; Voy. Astrol., Zool. ii., 1833, p. 531, pl. xxxvi., figs. 8-9.
Wanganui.

Murex octogonus espinosus Hutton; T.N.Z.I., xviii., 1886, p. 333.
Wanganui (Type and one paratype).

Trophon ambiguus Philippi; Abbild. *Fusus*, 1844, pl. i., fig. 2.
Wanganui (4).

Trophon cheesemani Hutton; N.Z. Journ. Sc., i., 1882, p. 69.
Wanganui.

Trophon bonneti Cossmann; Ess. Pal. Comp., v., 1903, p. 200, pl. iii., fig. 7.
Wanganui.

Trophon (*Kalydon*) *huttoni* Murdoch; T.N.Z.I., xxxii., 1900, p. 217, pl. xx., fig. 1.
Wanganui (Type).

Trophon (*Xanthochorus*) *expansus* Hutton; T.N.Z.I., xv., 1883, p. 410.
Wanganui (Type); Wanganui; Petane.

Trophon plebeius Hutton; Cat. Mar. Moll., 1873, p. 9.
Wanganui (5); Lower Gorge of Waipara.

Trophon corticatus Hutton; Cat. Mar. Moll., 1873, p. 9.
Petane (4).

Trophon gouldi Cossmann; Ess. Pal. Comp. v., 1903, p. 54,
Petane (7).

Fam. Thaisidae.

Thais striata Martyn; Univ. Conch. pl. vii. *Buccinum* i., 1784.
Greta (2); Broken River.

Fam. Cancellaridae.

Admete lacunosa Hutton; T.N.Z.I., xvii., 1885, p. 320.
Petane (Type).

Fam. Pyrenidae.

Mitrella choava Reeve; Conch. Icon., xi., 1859, pl. xxxvii., fig. 239.
Wanganui.

Alcira varians Hutton, T.N.Z.I., xvii., 1885, p. 314, pl. xviii., fig. 2.
Wanganui (Lecto-type and four paratypes).

Alcira angustata Hutton; T.N.Z.I., xviii., 1886, p. 333.
Petane (Type).

Anachis cancellaria Hutton; T.N.Z.I., xvii., 1885, p. 314.
Petane (Lecto-type and one paratype).

Anachis pisaniopsis Hutton; T.N.Z.I., xvii., 1885, p. 314.
Petane (Lecto-type and six paratypes).

Fam. VOLUTIDAE.

Fulguraria arabica Martyn; Univ. Conch., ii., 1784, fig. 52.
Waikari: Broken River (3); Porter River: Mount Harris.

Fulguraria arabica elongata Swainson; Exot. Conch., 1821, pls. xx-xxi.
Mount Harris; Pareora; Broken River; Waikari.

Fulguraria gracilis Swainson; Exot. Conch., xx., 1821, pl. xlii.
Wanganui; Greta; Porter River.

Fulguraria attenuata Hutton; Quart. Journ. Geol. Soc., xli., 1885, p. 555.
Waipara; Pareora.

Fulguraria (*Alcithoe*) *aculeata* Hutton; T.N.Z.I., xvii., 1885, p. 325.
White Rock River (Lecto-type and one paratype); Waihao Forks.

Lapparia corrugata Hutton; Cat. Tert. Moll., 1873, p. 7.
Greta; Orari; Mount Harris (4); Waihao; Goldsborough, Westland.

Volutospina (*Athleta*) *huttoni* Suter; var. *pseudorarispina* (McCoy) Suter; N.Z. Geol. Survey, Palæont. Bulletin, No. 2, part 2.
Kakahu; Porter River; Broken River.

Fam. OLIVIDAE.

Olivella neozelanica Hutton; T.N.Z.I., xvii., 1885, p. 314, pl. xviii., fig. 1.
Patea (Type); Greta; Shepherd's Hut, Waipara.

Ancilla australis Sowerby; Spec. Conch., i., 1830, p. 7, figs. 44-46.
Waihao (2); Wanganui (2); Porter River, Trelissick Basin (3); Motunau; Lower Gorge of Waipara.

Ancilla depressa Sowerby; Thes. Conch., iii., 1859, p. 63, pl. cexi., fig. 3.
Wanganui (Type of *A. lata*, Hutton); Te Ngawai (2); Waikopiro, Wellington (2); Pareora; Lower Gorge of Waipara; Awamoa; Shakespeare Cliff, Wanganui.

Ancilla hebera Hutton; Cat. Tert. Moll., 1873, p. 6.
White Rock (2); Pareora (3); Waikari; Lower Gorge of Waipara.

Ancilla, sp.?
Awamoa.

Fam. MARGINELLIDAE.

Marginella dubia Hutton; Cat. Tert. Moll., 1873, p. 8.
Broken River.

Marginella hectori T. W. Kirk; T.N.Z.I., xiv., 1882, p. 409.
Petane (3).

Marginella pygmada Sowerby; Thes. Conch., i., 1846, p. 386, pl. lxxv., figs. 78-79.
Petane (6).

Marginella albescens Hutton; Cat. Mar. Moll., 1873, p. 19.
Awamoa (10).

Fam. TURRITIDAE.

Turris altus Harris; Cat. Tert. Moll. Brit. Mus., part i., 1897, p. 45.
Awamoa (2); Mount Harris; Petane.

Turris nexilis Hutton; T.N.Z.I., xvii., 1885, p. 317, pl. xviii., fig. 9; sub. sp. *bicarinatus* Suter (M.S.).
Wanganui (Holotype and four paratypes).

Drillia buchanani Hutton; Cat. Tert. Moll. 1873, p. 4.
Petane (3); White Rock River (3); Wanganui.

Drillia wanganuiensis Hutton; Cat. Tert. Moll., 1873, p. 4.
Petane (4); Wanganui (5); var. Wanganui (10).

Drillia (*Crassipira*) *acquistriata* Hutton; T.N.Z.I., xviii., 1886, p. 334.
Petane (Holotype and two paratypes); Wanganui (?) (4).

Drillia laevis Hutton; Cat. Mar. Moll., 1873, p. 12.
Wanganui.

Drillia (*Crassispira*) *plicatella* Hutton; T.N.Z.I., xviii., 1886, p. 333.
Wanganui (Holotype).

Surcula hamiltoni Hutton; T.N.Z.I., xxxvii., 1905, p. 472, pl. xliv., fig. 1.
Waihao Forks (Holotype).

Surcula fusiformis Hutton; T.N.Z.I., ix., 1877, p. 595, pl. xvi., fig. 3.
Otaio; Awamoa; Waihao (4).

Surcula huttoni Suter; N.Z. Geol. Survey; Palæont. Bulletin No. 2, part 1, 1913, p. 28, pl. ii., fig. 10 (*Pleurotoma trailli* Hutton; Cat. Tert. Moll., p. 4, not of Cat. Mar. Moll., p. 11.)
White Rock River.

Surcula, sp.?
Wanganui (3).

Clavatula (*Perrona*) *neozelanica* Suter; T.N.Z.I., xlv., 1913, p. 294, pl. xii., fig. 3.
Lower Gorge of Waipara (Holotype).

Bathytoma albula Hutton; Cat. Mar. Moll., 1873, p. 12.
Petane (3); Awamoa.

Bathytoma haasti Hutton; T.N.Z.I., ix., 1877, p. 595, pl. xvi., fig. 5.
White Rock River (Lectotype); Mount Harris (2).

Bathytoma sulcata Hutton; Cat. Tert. Moll., 1873, p. 4.
Mount Harris; White Rock River; Upper Mohaka River; Waikari (2); Lower Gorge of Waipara.

Bathytoma nodilirata Murdoch and Suter; T.N.Z.I., xxxviii., 1906, p. 284, pl. xxii., figs. 10, 11 (= *Planotoma tuberculata* Kirk; T.N.Z.I., xiv., 1882, p. 409.)
Petane.

Bathytoma cheesemani Hutton; Jour. de Conch., xxvi., 1878, p. 16.
Wanganui (Holotype in Otago Museum).

Genota sp.?
Mount Horrible.

Genota excavata Hutton; T.N.Z.I., ix., 1877, p. 595, pl. xvi., fig. 6.
White Rock River (6).

Genota robusta Hutton; T.N.Z.I., ix., 1877, p. 595, pl. xvi., fig. 4.
White Rock River; Lower Gorge of Waipara.

Mangilia protensa Hutton; T.N.Z.I., xvii., 1885, p. 317.
Petane (Holotype and nine paratypes).
Awamoa (2); Mount Harris (2); Waihao (2).

Mangilia abnormis Hutton; T.N.Z.I., xvii., 1885, p. 316.
Petane (Holotype).

Mangilia dictyota Hutton; T.N.Z.I., xvii., 1885, p. 316, pl. xviii., fig. 8.
Petane (Holotype and four paratypes).

Mangilia leptosoma Hutton; T.N.Z.I., xvii., 1885, p. 328.
White Rock River (Holotype and six paratypes).

Mangilia sinclairii Smith; Ann. and Mag. Nat. Hist. (5), xiv., 1884, p. 320.
Wanganui (13).

Daphnella lacunosa Hutton; T.N.Z.I., xvii., 1885, p. 317.
Wanganui (Holotype).

Daphnella cancellata Hutton; Journ. de Conch., xxvi., 1878, p. 18.
Wanganui.

Daphnella striata Hutton; Cat. Tert. Moll., 1873, p. 5.
Wanganui (Type of *Siphonalia cingulata* Hutton); Petane; Wanganui.

Clathurella sp.?.
White Rock River.

Borsonia rudis Hutton; T.N.Z.I., xvii., 1885, p. 328.
Waihao (Holotype and four paratypes); Otaio.

Borsonia cincta Hutton; T.N.Z.I., xvii., 1885, p. 327.
White Rock River (Holotype and four paratypes).

Fam. Terebridae.

Terebra tristis Deshayes; Proc. Zool. Soc., 1859, p. 306.
White Rock River (2); Wanganui (4).

Terebra costata Hutton; T.N.Z.I., xvii., 1885, p. 315, pl. xviii., fig. 6.
Wanganui (Holotype); Awamoa.

Terebra biplex Hutton; T.N.Z.I., xvii., 1885, p. 327.
Pareora (Holotype); Lower Gorge of Waipara; Tutaekuri River.

Terebra orycta Suter; T.N.Z.I., xlv., 1913, p. 295, pl. xli., fig. 2.
Lower Waipara Gorge (Holotype).

Terebra catenifera Tate; Southern Science Rec., January, 1886, p. 5; Trans. Roy. Soc. S. Austr., xi., 1889, p. 160.
Tutaekuri (Type of *Cerithium bicorona* Hutton).

Fam. Scaphandridae.

Cylichnella striata Hutton; Cat. Mar. Moll., 1873, p. 52.
Petane; Awamoa.

Fam. Tornatinidae.

Tornatina pachys Watson; Journ. Linn. Soc., xvii., 1883, p. 331.
Wanganui.

Volvulella reflexa Hutton; T.N.Z.I., xviii., 1886, p. 333.
White Rock River.

Fam. RINGICULIDAE.

Ringicula uniplicata Hutton; T.N.Z.I., xvii., 1885, p. 313.
Petane.

Fam. ACTAEONIDAE.

Pupa alba Hutton; Cat. Mar. Moll., 1873, p. 51.
Wanganui.

Acteon sulcatus Hutton; T.N.Z.I., xvii., 1885, p. 319, pl. xviii., fig. 15.
Wanganui (Type).

Acteon ovalis Hutton; T.N.Z.I., xvii., 1885, p. 325.
White Rock River (Holotype and two paratypes).

Fam. PLEUROTOMARIIDAE.

Pleurotomaria tertiaria McCoy; Prod. Pal. Vict., Decade iii., 1876, p. 23, pl. xxv., fig. 1.
Mount Somers.

Scissurella mantelli Woodward; Proc. Zool. Soc., 1859, p. 202, pl. xlvi., fig. 8.
Petane.

Fam. FISSURELLIDAE.

Emarginula striatula Quoy and Gaimard; Voy. Astrol. iii., 1834, 332, pl. lxviii., figs. 21-22.
Wanganui.

Subemarginula parmorphoidea Quoy and Gaimard; Voy. Astrol., iii., 1834, p. 325, pl. lxviii., figs. 15, 16.
Wanganui.

Fissuridea monilifera Hutton; Cat. Mar. Moll., 1873, p. 42.
Wanganui.

Fam. SIPHONARIIDAE.

Siphonaria obliquata Sowerby; Cat. Coll. Tankerville, 1825, app. p. 7.
Motunau.

Fam. LITTORINIDAE.

Risella melanostoma Gmelin; Syst. Nat. ed. 13, 1789, p. 3581, No. 90.
Wanganui.

Fam. CONIDAE.

Hemiconus trailli Hutton; Cat. Tert. Moll., 1873, p. 10.
Awamoa; Point Hill, Waitaki; Broken River.

Conus ornatus Hutton; Cat. Tert. Moll., 1873, p. 10.
Awamoa.

Fam. AMPHIBOLIDAE.

Amphibola crenata Martyn; Univ. Conch., ii., 1784, fig. 69, p. 335. (= *Cyclostrema obliquata* Hutton).
Wanganui (Hutton's Type).

Fam. HELICIDAE.

Therasia decidua Pfr; Proc. Zool. Soc., 1857, p. 108.
Petane (2).

SCAPHOPODA.

Fam. DENTALIIDAE.

Dentalium nanum Hutton; Cat. Tert. Moll., 1873, p. 1.
Petane (3); Wanganui (4).

Dentalium mantelli Zittel; Reise Novara. Geol. ii., Pal., 1864, p. 45, pl. xiii., fig. 7.
Pareora (2); Waihao (3); Hampden (4); Otaio (3); Motunau (5); Waimea (3); Waikari (2); Porter River; Mohaka River (3); Whangape Lake.

Dentalium solidum Hutton; Cat. Tert. Moll., 1873, p. 2.
Oamaru (3); Whiterock River (3); Mount Harris; Lower Gorge of Waipara.

Dentalium pareorensis Pilsbry and Sharp; Man. Conch. (1), xvii. p. 211 (= *D. laeve* Hutton, *non* Scholtheim, 1820; Cat. Tert. Moll., 1873, p. 2).
Mount Harris (5).

Dentalium ecostatum Kirk; T.N.Z.I., xii., 1880, p. 306.
Wanganui (4); Pareora.

PELECYPODA.

Fam. Nuculidae.

Nucula nitidula A. Adams; P.Z.S., 1856, p. 51.
Petane (2).

Fam. Ledidae.

Leda semiteres Hutton; T.N.Z.I., ix., 1877, p. 598.
Waihao; Wanganui.

Leda bellula A. Adams; P.Z.S., 1856, p. 49.
Wanganui.

Poroleda lanceolata Hutton; T.N.Z.I., xvii., 1885, p. 332.
Petane (Type).

Malletia australis Quoy and Gaimard; Voy. Astrol., iii., 1835, p. 471, pl. lxxviii., figs. 5-10.
Waikari; Mount Harris.

Fam. Anomiidae.

Anomia huttoni Suter; Man. of Moll., 1913, p. 843, pl. lvii., fig. 8. (= *A. alectus* Hutton, *non* Gray).
White Rock River (6); Shrimpton's, Ngaruroro River.

Anomia undata Hutton; T.N.Z.I., xvii., 1885, p. 324 (= *A. cytaeum* Hutton, *non* Gray).
Petane (Type).

Placunanomia incisura Hutton; Cat. Tert. Moll., 1873, p. 34.
Pareora.

Placunanomia zelandica Gray; Dieffenbach's "New Zealand," 1843, p. 260.
Te Ngawai; Glenmark.

Fam. Arcidae.

Arca (Cucullaria) australis Hutton; T.N.Z.I., xvii., 1885, p. 331.
White Rock River (Type); Double Corner, Lower Gorge of Waipara.

Arca decussata Sowerby; P.Z.S., 1833, p. 18.
Wanganui (3).

Cucullaea ponderosa Hutton; Cat. Tert. Moll., 1873, p. 27.
Porter River; Broken River.

Cucullaea alta Sowerby; in Darwin's "Geol. Obs. on South America," 1846, p. 252, pl. ii., figs. 22, 23.
Waikari River (2); Kakahu (2); Lower Gorge of Waipara; Greta.

Cucullaea attenuata Hutton; Cat. Tert. Moll., 1873, p. 28.
Lake Wakatipu; Collingwood.

Cucullaea sp.
Broken River.

Limopsis zittcli, von. Ihering; Anal. del Mus. Nacion., Buenos Aires, xiv., 1907, p. 235.
Pareora (2); also two specimens without locality indicated.

Limopsis aurita Brocchi; Conch. Foss. Subapenninae, 1814, p. 485, pl. ix., fig. 9.
Otaio (5); Waitaki (4); Mount Harris (3); Waihao (3).

Glycymeris cordata Hutton; Cat. Tert. Moll., 1873, p. 28.
Greta; White Rock River.

Glycymeris modesta Angus; P.Z.S., 1879, p. 418, pl. xxxv., fig. 4.
Shrimpton's, Ngaruroro River; Wanganui.

Glycymeris laticostata Quoy and Gaimard; Voy. Astrol. Zool. iii., 1835, p. 466, pl. lxxvii., figs. 1, 2, and 4-6.
Porter River; Waikari River.

Glycymeris globosa Hutton; Cat. Tert. Moll., 1873, p. 28.
Orari River; The Point, Waitaki; Shingly Creek, Lake Heron; Porter River; Broken River; Kakahu; Lower Gorge of Waipara; Waipara (precise locality not indicated); Pareora (2); Redcliff Gully, Rakaia.

Glycymeris sp.
Broken River.

Fam. Philobryidae.

Philobrya trigonopsis Hutton; T.N.Z.I., xvii., 1885, p. 324.
Petane (Holotype and three paratypes); Wanganui.

Fam. Mytilidae.

Mytilus striatus Hutton; T.N.Z.I., xvii., 1885, p. 332.
Broken River (Type).

Modiolus australis Gray; App. to King's Voy., ii., 1827, p. 477.
Porter River.

Fam. Pectinidae.

Pecten beethami Hutton; Cat. Tert. Moll. 1873, p. 31.
White Rock Quarry, North Canterbury; Hawke's Bay (actual locality not indicated); Mount Somers (2).

Pecten delicatulus Hutton; Cat. Tert. Moll., 1873, p. 30 (= *P. difffluxa* Hutton, *l.c.*, p. 31).
Castle Point (right valve); Greta (left valve); Motunau (left valve); Lower Gorge of Waipara; Hundalee.

Pecten sectus Hutton; Cat. Tert. Moll., 1873, p. 30.
Chatham Island (left valve); Chatham Island (right valve); Callaghan's Creek.

Pecten (Chlamys) dendyi Hutton; T.N.Z.I. xxxiv., 1902, p. 196, pl. viii.
Chatham Islands (Type).

Pecten burnetti Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 51, pl. x., fig. 2.
Castle Hill; Castle Point; Mount Brown.

Pecten polymorphoides Zittel; Reise Novara, Geol. ii., Pal., p. 51, pl. xi., fig. 3.
North Island (actual locality not indicated).

Pecten williamsoni Zittel; Reise Novara Geol. ii., Pal., 1864, p. 50, pl. ix., fig. 11.
Weka Pass; Oxford; Waipara (2); Curiosity Shop (2).

Pecten zelandiae Gray; in Dieffenbach's "New Zealand," 1843, p. 260.
Wanganui (4).

Pecten athleta Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 49, pl. x., fig. 1.
Waikari.

Pecten triphooki Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 52, pl. xi., fig. 4.
Napier (2); Double Corner; Upper Waitotara.

Pecten (Chlamys) hillii Hutton; T.N.Z.I., xxxvii., 1905, p. 473, pl. xliv., fig. 3.
Napier (Type); Lower Gorge of Waipara.

Pecten semiplicatus Hutton; Cat. Tert. Moll., 1873, p. 30.
Napier.

Pecten hutchinsoni Hector; Cat. Col. Mus., 1870, p. 183, *nom. nud.*; Hutton; Cat. Tert. Moll., 1873, p. 31.
Oamaru; Broken River; Porter River (2).

Pecten accrementus Hutton; Cat. Tert. Moll., 1873, p. 31.
Oamaru (2).

Pecten scandulus Hutton; Cat. Tert. Moll., 1873, p. 29.
Curiosity Shop; Weka Pass (2).

Pecten fischeri Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 53, pl. ix., fig. 1, 2.
Weka Pass.

Pecten (Pseudamusium) huttoni Park; T.N.Z.I., xxxvii., 1905, p. 485.
Duntroon (Type); Anama; Mount Somers (2); Weka Pass; Kakahu; Curiosity Shop.

Pecten (Amusium) zitteli Hutton; Cat. Tert. Moll., 1873, p. 32.
Whangape Lake (2).

Pecten medius Lamark; Anim. s. vert., vi., 1819, p. 163.
Wanganui; Waihao. Another specimen occurs, but the locality is not indicated.

Fam. Limidae.

Lima paucisulcata Hutton; Cat. Tert. Moll., 1873, p. 33.
Mount Somers; Broken River; Pareora.

Lima paleata Hutton; Cat. Tert. Moll., 1873, p. 33.
Curiosity Shop (2); Lower Gorge of the Waipara.

Lima colorata Hutton; Cat. Tert. Moll., 1873, p. 33.
Pareora (2); Mount Horrible (2).

Lima bullata Born; Mus. Cæs. Vindobon., 1780, p. 110, pl. vi., fig. 8.
Broken River; Lower Gorge of the Waipara.

Lima (Plagiostoma) laevigata Hutton; Cat. Tert. Moll., 1873, p. 33.
Opuha; Duntroon; Mount Somers (2).

Fam. Ostreidae.

Ostrea hyotis Linné; Syst. Nat., ed. 10, 1758, p. 704.
Shakespeare Cliff, Wanganui (2).

Ostrea angasi Sowerby; Conch. Icon., xviii., 1871, pl. xiii., fig. 27.
Shrimpton's, Ngaruroro River (2); Wanganui (3); Motunau; Waipara; Kakahu; Waimate.

Ostrea corrugata Hutton; Cat. Tert. Moll., 1873, p. 35.
Waihi River.

Ostrea wullerstorfii Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 54, pl. xi., fig. 6.
Waihao.

Ostrea ingens Zittel: Reise Novara, Geol. ii., Pal., 1864, p. 54, pl. xiii., fig. 3.
Napier; Thames River; Camp Creek; Trelissick?.

Ostrea nelsoniana Zittel: Reise Novara, Geol. ii., Pal., 1864, p. 55, pl. xi., fig. 7.
Waikari River; Orari; Glenmark; Motunau; Lower Gorge of Waipara.

Fam. PINNIDAE.

Atrina zelandica Gray; Yates' "New Zealand," 1835, p. 310.
Kakahu (2); Curiosity Shop.

Fam. PERNIDAE.

Perna sp.
Matapiro, Hawke's Bay.

Fam. CRASSATELLITIDAE.

Crassatellites obesus A. Adams; P.Z.S., 1852 (1854), p. 90, pl. xvi., fig. 2 (= *C. trailli* Hutton; Cat. Tert. Moll., 1873, p. 24).
Mount Harris; Wharekuri; Mount Horrible; Pareora; Awamoa.

Crassatellites amplus Zittel: Voy. Novara, Geol. ii., Pal., 1864, p. 46; pl. 14, fig. 3.
Porter River; Lower Gorge of Waipara.

Crassatellites attenuatus Hutton: Cat. Tert. Moll., 1873, p. 24.
Porter River; Point Hill, Waitaki.

Fam. ASTARTIDAE.

Astarte australis Hutton; Cat. Tert. Moll., 1873, p. 25.
Kakahu.

Fam. CARDITIDAE.

Venericardia bollonsi Suter; P. Mal. Soc. vii., 1907, p. 211, pl. xviii., figs. 8, 8a.
Petane (3).

Venericardia difficilis Deshayes; Proc. Zool. Soc., 1852 (1854), p. 103, pl. xvii., figs. 16, 17.
Tuffs below limestone, Kakanui (2); Shakespeare Cliff, Wanganui (2).

Venericardia australis Lamarck; Anim. sans. Vert., 1818, p. 610. (= *Venericardia awamoaensis* Harris; for *Venericardia intermedia* Hutt., which, however, is *V. australis* Lamarck, identified by Suter after type specimen).
Wanganui; Shepherd's Hut, Waipara; Lower Gorge of Waipara; Porter River (6); Mount Harris (3); Orari (2).

Cardita calyculata Linné; Syst. Nat., ed. 10, 1758, p. 692.
Wanganui (2).

Fam. Lucinidae.

Loripes concinna Hutton; T.N.Z.I., xvii., 1885, p. 323.
Wanganui (Type); White Rock River.

Loripes laminata Hutton; T.N.Z.I., xvii., 1885, p. 331.
White Rock River (Type).

Divaricella cumingi A. Adams and Angas; Proc. Zool. Soc., 1863, p. 426, pl. xxxvii., fig. 20.
Wanganui; Porter River; Pareora.

Fam. Diplodontidae.

Diplodonta zelandica Gray; Yates' "New Zealand," 1835, p. 309.
Kakanui.

Diplodonta globularis Lamark; Anim. sans. Vert., v., 1818, p. 544.
Wanganui (2).

Diplodonta ampla Hutton; T.N.Z.I., xvii., 1885, p. 323.
Wanganui (Type).

Fam. Leptonidae.

Neolepton effossum Hutton; T.N.Z.I., xvii., 1885, p. 323.
Petane (Type).

Neolepton robustum Hutton; T.N.Z.I., xvii., 1885, p. 323.
Petane (Type).

Fam. Tellinidae.

Tellina eugonia Suter (= *T. angulata* Hutton); T.N.Z.I., xvii., 1885, p. 322.
Wanganui (Type).

Fam. Semelidae.

Leptomya lintea Hutton; Cat. Mar. Moll., 1873, p. 67.
Wanganui (Type).

Fam. Mactridae.

Mactra attenuata Hutton; Cat. Tert. Moll., 1873, p. 18.
Porter River (2).

Mactra scalpellum Reeve; Conch. Icon., viii., 1854, pl. xix., fig. 106.
Petane (4); Matapiro, Hawke's Bay; Wanganui (3).

Mactra ovata Gray; in Dieffenbach's N.Z., 1843, p. 251.
Petane (Holotype and five paratypes of *M. lavata* Hutton.)

Mactra chrydaea Suter; T.N.Z.I., xliii., 1911, p. 596, pl. xxxi.
Turangarere (Metatype); Greta.

Mactra (*Mactroderma*) *crassa* Hutton; T.N.Z.I., xvii., 1885, p. 332.
Wanganui (Holotype and one paratype).

Spisula ordinaria E. A. Smith; Pub. Mal. Soc., iii., 1898, p. 23, fig. 7 in text.
Wanganui.

Lutraria solida Hutton; Cat. Tert. Moll., 1873, p. 19.
Ngaruroro, Hawke's Bay.

Zenatia acinaces Quoy and Gaimard; Voy. Astrol. iii., 1835, p. 545, pl. lxxxiii., figs. 5, 6.
Wanganui (2).

Fam. Veneridae.

Chione crassa Quoy and Gaimard; Voy. Astrol., iii., 1835, p. 525, pl. lxxxiv., fig. 7-8.
Wanganui (4); Napier; Motunau; Point Hill, Waitaki.

Chione meridionalis Sowerby; in Darwin's "Geol. Obs. in S. America," 1846, p. 250, pl. ii., fig. 13.
Waikari (2); Greta; White Rock River.

Chione yatei Gray; Yates' "New Zealand." 1885, p. 309.
Porter River.

Chione speighti Suter; T.N.Z.I., xlv., 1913, p. 296; pl. xiv.
Lower Waipara Gorge (Holotype and one paratype. Another specimen from the same locality shows the hinge.

Chione stutchburyi Gray; in Wood's "Index Tert.." suppl., 1828, fig. 4; Yates' "N.Z.," 1835, p. 308.
Lower Gorge of Waipara (2).

Chione acuminata Hutton; Cat. Tert. Moll., 1873, p. 21.
Pareora (2).

Paphia curta Hutton; Cat. Tert. Moll., 1873, p. 22.
The Point, Waitaki; Porter River (5).

Dosinia magna Hutton; Cat. Tert. Moll., 1873, p. 22.
Porter River (2); Lower Gorge of Waipara (2); Kakahu.

Dosinia greyi Zittel; Reise Novara, Geol. ii., Pal., pt. 2, 1864, p. 45, pl. xv., fig. 11.
Lower Gorge of Waipara; Greta (2). Another specimen, locality not indicated.

Dosinia sub-rosea Gray; in Yates' "New Zealand." 1835, p. 309.
Motunau (3); Lower Gorge of Waipara.

Dosinia lambata Gould; U.S. Expl. Expd., xii., 1850, p. 422, Atlas, fig. 530.
Wanganui (3); Pareora (2); Lower Gorge of Waipara.

Cytherea sub-sulcata Suter (= *Venus sulcata* Hutton); Proc. Linn. Soc., N.S.W. (2), i., 1887, p. 226.
Shrimpton's, Ngaruroro River (Idiotype); Motunau.

Cytherea oblonga Hanley; Wood's Index Tert., suppl., 1828.
Castle Point, Wellington.

Cytherea enysi Hutton; Cat. Tert. Moll., 1873, p. 21.
Porter River (2).

Macrocallista assimilis Hutton; Cat. Tert. Moll., 1873, p. 21.
Porter River (2); Wanganui; Point Hill, Waitaki.

Macrocallista multistriata Sowerby; Thes. Conch., ii., 1851, p. 628, pl. cxxxvi., fig. 177.
Motunau (2); Lower Gorge of Waipara.

Meretrix sp.
Clent Hills Station.

Fam. CARDIIDAE.

Cardium spatiosum Hutton; Cat. Tert. Moll., 1873, p. 23.
Broken River; Porter River; Lower Gorge of Waipara.

Cardium huttoni von. Ihering; Anal. del Mus. Buenos Aires, xiv., 1907, p. 291 (= *C. multiradiatum* Hutton; not of Sowerby).
Double Corner, Lower Gorge of Waipara.

Cardium patulum Hutton; Cat. Tert. Moll., 1873, p. 23.
Porter River; Lower Gorge of Waipara.

Cardium (*Fragum*) sp.
Weka Pass Stone; Waikari Valley.

Hemicardium sp.?
Ormond, Poverty Bay.

Protocardium scrum Hutton; Cat. Tert. Moll., 1873, p. 23.
Broken River.

Fam. PSAMMOBIIDAE.

Psammobia lineolata Gray; Yates' "New Zealand." 1835, p. 309.
Wanganui; Waitaki (2).

Solctellina nitida Gray; Dieffenbach's "New Zealand." 1843, p. 253.
Pareora.

Fam. CORBULIDAE.

Corbula pumila Hutton; T.N.Z.I., xvii., 1885, p. 330.
White Rock River (Type).

Corbula macilenta Hutton; Cat. Tert. Moll., 1873, p. 18.
Wanganui (3).

Corbula canaliculata Hutton (= *C. sulcata* Hutton); T.N.Z.I., ix., 1877, p. 598, pl. xvi., fig. 14.
Mount Harris (Lectotype).

Corbula humerosa Hutton; T.N.Z.I., xvii., 1885, p. 330.
White Rock River (Type).

Fam. SAXICAVIDAE.

Panopea zelandica Quoy and Gaimard; Voy. Astrol., iii., 1835, p. 547, pl. lxxxiii., figs. 7-9.
Watakuhi, Bay of Islands; Pareora; Motunau.

Panopea orbita Hutton; Quart. Journ. Geol. Soc., xli., 1885, p. 551 (= *P. plicata* Hutton; Cat. Tert. Moll., p. 17).
Pareora; Mount Harris; Greta; Lower Gorge of Waipara.

Panopea worthingtoni Hutton; Cat. Tert. Moll., 1873, p. 17.
Lake Wakatipu (2).

Fam. TEREDINIDAE.

Teredo heaphyi Zittel; Reise Novara, Geol. ii., Pal., 1864, p. 45, pl. xiv., fig. 4 (= *Cladopora directa* Hutton; T.N.Z.I., ix., 1877, p. 597, pl. xvi., fig. 13).
Waihao; Te Ngawai; Curiosity Shop; White Water River, Trelissick.

Fam. THRACIIDAE.

Thracia vitrea Hutton; Cat. Mar. Moll., 1873, p. 61.
Wanganui.

Fam. MYOCHAMIDAE.

Myodora novae-zealandiae E. A. Smith; Proc. Zool. Soc., 1880, p. 584, pl. liii., fig. 5.
Wanganui.

Myodora subrostrata E. A. Smith; Proc. Zool. Soc., 1880, p. 584 pl. liii., fig. 6.
Awamoa (5).

Myodora boltoni E. A. Smith; Proc. Zool. Soc., 1880, p. 585, pl. liii., fig. 9.
Matapiro, Hawke's Bay.

Myodora antipodum E. A. Smith; Proc. Zool. Soc., 1880, p. 585, pl. liii., fig. 7.
Wanganui.

Myodora striata Quoy and Gaimard; Voy. Astrol., iii., 1835, p. 537, pl. lxxxiii, fig. 10.
Wanganui (2).

Pholadomya sp.?
Porter River.

Fam. CHAMOSTREIDAE.

Chama huttoni Hector; Outline of the Geology of N. Zealand, 1886, p. 50, fig. 7, no. 7.
Castle Point, Wellington.

Chamostrea albida Lamarck; Anim. sans Vert., ed. 2, vi., 1819, p. 96.
Porter River; Wanganui.

CEPHALOPODA.

Fam. NAUTILIDAE.

Aturia aturi var. *australis* McCoy; Ann. Mag. Nat. Hist. ser. 3, xx., 1867, p. 192.
Double Corner, Lower Gorge of Waipara; Weka Pass.

Fam. BELEMNITIDAE.

Belemnites lindsayi Hector.
Waitaki Valley (7).
The status of this species is, at the request of Professor Park, being considered by Dr. F. A. Bather.

DESCRIPTIONS
OF
TWO NEW MARINE SHELLS
FROM
NEW ZEALAND

By Henry Suter.

Figures 1 and 2.

Having lately overhauled and rearranged the collection of recent mollusca in the Canterbury Museum, I found two unnamed marine species, which prove to be new to science. They are described and figured below:—

Siphonium planatum sp. nov.

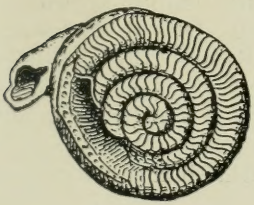


Fig. 1

Shell very small, adherent planorbiform, sinistral, the lower volutions somewhat irregular, the upper ones spirally wound up, the apex subcentral. *Sculpture*: the whorls are distinctly angled, and ornamented with close sinuous transverse ridges. *Colour*, white. *Whorls* 8 to 10, narrow. *Suture* well marked. *Aperture* triangular or quadrangular, without internal armature. *Operculum* not seen.

Dimensions.—Diameter maj. 10 mm., min. 8·5; height 4 mm.; diameter of aperture 1·2 mm. (Holotype).—Diameter maj. 8·5 mm., min. 8 mm.; height 5 mm.; diameter of aperture 1 mm. (Paratype).

Holotype and 1 *paratype* in the Canterbury Museum, Christchurch.

Hab.—Kapiti Island.

Remarks.—This species very much resembles *S. politum* Daudin, from the Indian Ocean[17]. Quite recently it has been discovered in the Miocene of the Trelissick Basin, and at Oamaru.

(17) Man. Conch (1), viii., 1886, pl. liv., fig. 85.

TROPHON VIRGINALIS sp. nov.

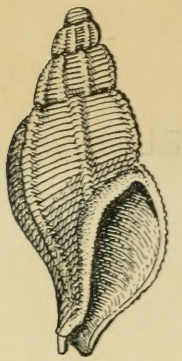


Fig. 2

Shell rather small, white, fusiform, with distant rounded varices, and close spiral cords. *Sculpture* consisting of rounded, distant varices, 5 on the body-whorl, 9 on the penultimate whorl, mostly discontinuous over the whorls; interspaces with close and fine axial riblets; spiral sculpture formed by close cords, 12 on the penultimate whorl, passing over the varices; slightly gemmulate at the intersection with the axial riblets; sometimes with a fine thread intercalated between the cinguli. *Colour*, white, semi-transparent. *Spire* narrowly conical, about the same height as the aperture with canal. *Protoconch* missing. *Whorls* about 5, convex, somewhat flattened below the suture, the body-whorl slightly ventricose, contracted at the base. *Suture* not much impressed. *Aperture* subvertical, oval, angled above, produced below into a short open canal, which is slightly turned backwards and to the left. *Outer lip sharp,* strengthened on the outside by a varix, convex above, but slightly concave towards the canal. *Columella* straight, lightly truncated below. *Inner lip* thin, broadly spread over the body, free at its lower part, leaving a narrow chink between it and the distinct siphonal fasciole. *Operculum* unknown.

Dimensions.—Height, 16 mm.; diameter, 7 mm.; angle of spire, 38°.

Holotype in the Canterbury Museum, Christchurch.

Hab.—Cape Maria van Diemen.